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JOURNAL
OF THE
ASIATIC SOCIETY
OF
✓
BENGAL.

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VOL. XI.

PART II. JULY TO DECEMBER, 1842.

NEW SERIES.

"It will flourish, if naturalists, chemists, antiquaries, philologists, and men of science, in different parts of *Asia* will commit their observations to writing, and send them to the Asiatic Society in Calcutta; it will languish, if such communications shall be long intermitted; and will die away, if they shall entirely cease."—SIR WM. JONES.

CALCUTTA :
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1842.

CONTENTS.

PART II.

No. 127.

	<i>Page.</i>
I.—A Sixth Memoir on the Law of Storms in India, being Storms in the China Seas, from 1780 to 1841. By Henry Piddington, Esq.	605
II.—Observations on the Herat Astrolabe, described in No. 118, of the Journal. By the Rev. J. S. Pratt, Chaplain to the Right Rev. the Lord Bishop of Calcutta.	720

No. 128.

I.—A description of the Coal Field of the Damoodah Valley and the adjacent Countries of Beerbhoom and Poorooleah, as applicable to the present date, 1842. By J. Homfray, Esq.	728
II.—A Monograph of the species of Lynx. By Edward Blyth, Curator to the Asiatic Society.	740
III.—Selections communicated by the Sudder Board of Revenue at Allahabad, from Correspondence respecting the proposed formation of a Canal for Irrigation to be supplied from the River Jumna, near the Village of Kuttha Putthur, in the Deyra Doon. From Capt. P. T. Cautley, to the Secretary of the Sudder Board of Revenue, North Western Provinces,	761
IV.—Comparison of the Areas of Plane and Spherical Triangles. By Capt. Shortrede, 1st Assistant, Grand Trigonometrical Survey...	779
V.—A Note on Capt. Shortrede's Remarks in No. CXXIII, (Page 240) of this Journal. By S. G. T. Heatly Esq.	782
VI.—Descriptive Notice of the Bat described as <i>Taphozous longimanus</i> by Gen. Hardwicke. By Edward Blyth, Curator to the Asiatic Society.	784
VII.—Proceedings of the Asiatic Society.	786

No. 129.

I.—Contributions towards a History of the development of the Mineral Resources of India. By S. G. Tollemache Heatly, Esq.	811
II.—Memorandum on the usual Building Materials of the district of Cuttack, forwarded to the Museum of Economic Geology, with a set of specimens. By Lieut. Rigny, Executive Engineer, Cuttack Division.	839
III.—Second Report on the Tin of Mergui. By Capt. G. B. Tremenheere, F. R. S. Executive Engineer, Tenasserim Division.	839
IV.—Notes on the Iron of the Kasia Hills, for the Museum of Economic Geology. By Lieut. Yule, Engineers.	853

	<i>Page.</i>
V.—Captain Thos. Hutton on Galeodes (vorax ?)	857
VI.—Proceedings of the Asiatic Society for August.	863
VII.—Proceedings of the Asiatic Society for September.	876

No. 130.

I.—A Monograph of the Indian and Malayan species of Cuculidæ, or Birds of the Cuckoo family. By Edward Blyth, Curator of the Asiatic Society. ..	897
II.—Notes, principally Geological, on the Tract between Bellary and Bijapore. By Capt. Newbold, F. R. S. &c. Madras Army.	929
III.—Notes, principally Geological, from Bijapore to Bellary, via Kannighirri. By Capt. Newbold, F. R. S. &c. Madras Army.	941
IV.—Ancient Inscription found at Aden, Communicated to the Asiatic Society by the Government of India. With a plate.	958
V.—Meteors observed at Allahabad on the 10th of August, 1842. By Capt. Shortrede, 1st Assistant, Grand Trigonometrical Survey of India. ..	959
VI.—Memorandum on the "Bora Chung," of Bootan. By A. Campbell, Esq., Superintendent, Darjeeling,	963
VII.—Proceedings of the Asiatic Society for October.	964

No. 131.

I.—A Seventh Memoir on the Law of Storms in India; being the Calcutta Hurricane of 3rd and 4th June 1842. By Henry Piddington, Esq.	971
II.—A Monograph of the Indian and Malayan species of Cuculidæ, or Birds of the Cuckoo family. By Edward Blyth, Curator of the Asiatic Society.— (Concluded.)	1095
III.—The Avatars of Vishnoo. An abstract Translation from the Pudma Pooran. By E. C. Ravenshaw, Esq.	1112

No. 132.

I.—Specimens offered to the Asiatic Society of Bengal. By Captain Newbold, F. R. S. &c. Madras Army,	1131
II.—Report on a Route from Pakung Yeh in Ava, to Aeng in Arracan. By Lieut. Trant, of the Q. M. G. Dept.,	1136
III.—Capt. Manson's Journal of a Visit to Melum and the Oonta Dhoora Pass in Juwahir. Edited by J. H. Batten, Esq. C. S. for the Journal of the Asiatic Society.	1157
IV.—On the Wool of the Bactrian, or two-humped Camel (Camelus Bactrianus,) being a Copy of an unpublished paper forwarded to the Royal Asiatic Society of London. By Captain Thomas Hutton,	1182
V.—Public Papers relating to the Nurma or Chanderi Cotton, in reference to queries by Mr. Piddington, Journal Asiatic Society Vol. X. p. 715; being a report to Government by Capt. J. Abbott, Assistant Resident Nimaaur.	1188
VI.—Proceedings of the Asiatic Society for November.	1198
VII.—Proceedings of the Asiatic Society for December... ..	1204

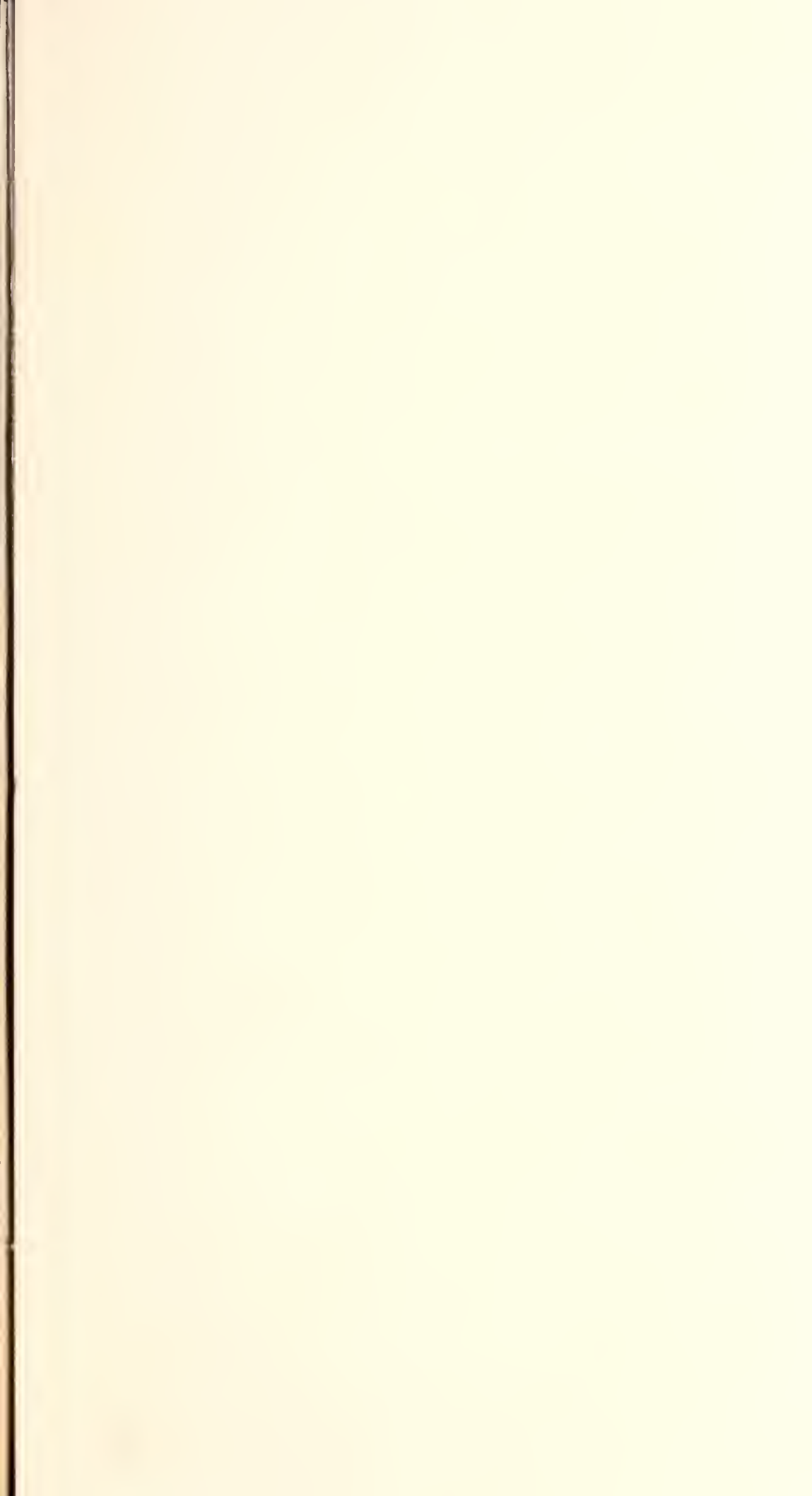
INDEX TO PART II.

	<i>Page.</i>		<i>Page.</i>
Ancient Inscription found at Aden. Communicated to the Asiatic Society by the Government of India. With a plate. By Capt. Haines, ..	958	culidæ. A Monograph of the, or Birds of the Cuckoo family. By Edward Blyth,	897-1095
Areas of Plane and Spherical Triangles. Comparison of the. By Capt. Shortrede,	776	Iron of the Kasia Hills. Notes on the, for the Museum of Economic Geology. By Lieut. Yule,	853
Avatar of Vishnoo. An abstract Translation of the, from the Pudma Pooran. By E. C. Ravenshaw Esq.	1112	Law of Storms in India. A Sixth Memoir on the, being Storms in the China Seas, from 1780 to 1841. By H. Piddington, Esq.	605
Bat described as <i>Tapozous longimanus</i> , by Gen. Hardwicke. Descriptive Notice of. By Ed. Blyth,	784	Law of Storms in India. A Seventh Memoir on the, being the Calcutta Hurricane of 3rd and 4th June 1842. By Henry Piddington, Esq.	971
Bijapore to Bellary, via Kannighirri Notes principally Geological, from. By Capt. Newbold, F. R. S. &c. .	941	Meteors observed at Allahabad on the 10th of August, 1812. By Capt. Shortrede, ..	951
Bora Chung, of Bootan. Memorandum on the. By A. Campbell, Esq.	963	Note on Capt. Shortrede's Remarks in No. CXXIII, (page 240) of this Journal. By S. G. T. Heatly, Esq.	782
Building Materials of the district of Cuttack. Memorandum on, forwarded to the Museum of Economic Geology, with a set of specimens. By Lieut. Rigby,	836	Nurma or Chanderi Cotton in reference to queries by Mr. Piddington, By Capt. Abbott, Journal Asiatic Society Vol. X. p. 716,	1188
Canal for Irrigation. Selections communicated by the Sudder Board of Revenue at Allahabad, from Correspondence respecting the proposed formation of a, from the river Jumna, near the Village of Kuttha Putthur, in the Deyra Doon. From Capt. P. T. Cautley,.	761	Proceedings of the Asiatic Society, 786, 863, 876, 964, 1198, 1204	
Coal Field of the Damoodah Valley. A description of the, and the adjacent countries of Beerbhoom and Pooorooleah, as applicable to the present date 1842. By J. Homfray, Esq.	723	Route from Pakung Yeh in Ava to Aeng in Arracan. Report on a. By Lieut. Trant, ..	1136
Galeodes (vorax ?) Capt. T. Hutton, on,	857	Species of Lynx, a Monograph of. the. By Edward Blyth	740
Herat Astrolabe. Observations on the, described in No. 118, of the Journal. By Rev. J. S. Pratt, ..	720	Specimens offered to the Asiatic Society of Bengal. By Capt. Newbold, F. R. S.	1131
History of the development of the Mineral Resources of India. Contributions towards. By S. G. Tollemache Heatly, Esq.	811	Tin of Mergui, Second Report on the. By Capt. G. B. Tremcnheere.	839
Indian and Malayan species of <i>Cuculidæ</i> .		Tract between Bellary and Bijapore. Notes, principally Geological, on the. By Capt. Newbold, F. R. S. &c.	929
		Visit to Melum and the Oonta Dhoora Pass in Juwahir, Edited by J. H. Batten, Esq. C. S. Journal of a. By Capt. Manson,	1157
		Wool of the Bactrian, or two humped Camels, (<i>Camelus Bactrianus</i> .) By Capt. Thomas Hutton, ..	1182

INDEX TO NAMES OF AUTHORS.

PART II.

	Page.		Page.
ABBOTT, Capt. Nurma or Chanderi Cotton, in reference to queries by Mr. PIDDINGTON, Journal Asiatic Society Vol. X. p. 716, ..	1188	MANSON, Capt. Visit to Melum and the Oonta Dhoora Pass in Juwahir, Edited by J. H. BATTEN, Esq. C. S. Journal of a.....	1157
ASIATIC SOCIETY, Proceedings of the, 786, 863, 876, 964, 1198,	1204	NEWBOLD, Capt. F. R. S. &c. Tract between Bellary and Bijapore. Notes, principally Geological, on the,	929
BLYTH, EDWARD. Species of Lynx, a Monograph of the.	740	..... Bijapore to Bellary, via Kannighirri. Notes principally Geological, from.	941
..... Bat described as Taphozous longimanus, by Gen. HARDWICKE. Descriptive Notice of,	784	..... Specimens offered to the Asiatic Society of Bengal.	1131
..... Indian and Malayan species of Cuculidæ. A Monograph of the, or Birds of the Cuckoo family.	897-1095	PIDDINGTON, H. Esq. Law of Storms in India. A Sixth Memoir on the, being Storms in the China Seas, from. 1780 to 1841.	605
CAMPBELL, A. Esq. Bora Chung, of Bootan. Memorandum on the.	963	..... Law of Storms in India. A Seventh Memoir on the, being the Calcutta Hurricane of 3rd and 4th June 1842.....	971
CAUTLEY, P. T. Capt. Canal for Irrigation. Selections communicated by the Sudder Board of Revenue at Allahabad, from Correspondence respecting the proposed formation of a, from the river Jumna, near the Village of Kuttha Putthur, in the Deyra Doon.	761	PRATT, REV. J. S. Herat Astro-labe. Observations on the, described in No. 118, of the Journal.....	720
HAINES, Capt. Ancient Inscription found at Aden. Communicated to the Asiatic Society by the Government of India. With a plate,....	958	RAVENSHAW, E. C. Esq. Avatar of Vishnoo. An abstract Translation of the, from the Pudma Pooran....	1112
HEATLY, S. G. T. Esq. A Note on Capt. SHORTEDE's Remarks in No. CXXIII, (Page 240) of this Journal.	782	RIGBY, Lieut. Building Materials of the district of Cuttack. Memorandum on, forwarded to the Museum of Economic Geology, with a set of specimens.	836
..... History of the developement of the Mineral Resources of India. Contributions towards a,	811	SHORTEDE, Capt. Areas of Plane and Spherical Triangles. Comparison of the.	776
HOMFRAY, J. Esq. Coal Field of the Damoodah Valley. A description of the, and the adjacent countries of Beerbhoom and Pooroolah, as applicable to the present date 1842.	723	..... Meteors observed at Allahabad on the 10th of August, 1842.....	951
HUTTON, THOS. Captain. On Galeodes (vorax?)	857	TRANT, Lieut. Route from Pakung Yeh in Ava, to Aeng in Arracan. Report on a,	1136
..... Wool of the Bactrian, or two humped Camel, (Camelus Bactrianus.) ..	1182	TREMENHEERE, G. B. Capt. Tin of Mergui, Second Report on the.	839
		YULE, Lieut. Iron of the Kasia Hills. Notes on the, for the Museum of Economic Geology.	853



JOURNAL

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ASIATIC SOCIETY.

A SEVENTH *Memoir on the Law of Storms in India; being THE CALCUTTA HURRICANE of 3rd and 4th June 1842.* BY HENRY PIDDINGTON, ESQ.

On the 3rd June 1842, Calcutta was visited by a tremendous hurricane, of which the centre passed over the city. It came from the South-east, and seems to have reached, with interruptions and divisions, as far inland as Dinagepore, Purneah, Monghyr, Purulia and Midnapore; beyond which we can trace only irregularities, such as we may suppose, to occur by the last efforts of the impetus of a storm.

The damage done in Calcutta alone, and to the shipping on the river, very few of which escaped some injury, was immense. Ships were blown and drifted from Calcutta to Cossipore, where two or three were sunk; many were sunk or driven on shore at Calcutta; and near Kedgeree, the *Globe* and *Symmetry* were totally lost.

The opportunity was not one to be neglected, and I made every effort to procure information by a public request in the papers, and by every other means I could think of. I am happy to say I was most cordially seconded by all classes, and have thus collected a highly valuable mass of documents, which we may perhaps pronounce by far the completest record of the course of a storm, which has yet been published. I beg to tender my best thanks to the gentlemen who have so kindly assisted the enquiry. I believe I have acknowledged, individually, every report which reached me; but

should I in any one instance have omitted to do so, I request the party to believe that this is wholly unintentional, and arises from my having no other time than the intervals of business, and hours of rest or relaxation, to devote to the research.

I now give the different documents, observing that I have invariably abridged them by retrenching all matter, and even phrases and words, which do not strictly relate to our subject. The Logs of ships from Ceylon and the Andamans to the Sand Heads, are naturally the first class, as tracing the storm from seaward, and shewing the state of the weather in the Bay.

SECTION I.

SHIPS IN THE BAY OF BENGAL.

Extract from the Log of the Barque JOHN CRAIG, Captain G. Pettingall, from Algoa Bay to Calcutta, reduced to civil time.

30th May, 1842.—At 10 A. M. a heavy squall, wind W. S. W. Noon latitude $5^{\circ} 49' N.$, long. $84^{\circ} 42' E.$, P. M. strong gales W. S. W., Thermometer 80° , Barometer 29.5.

31st May.—Throughout strong and hard gale W. S. W. Noon latitude $9^{\circ} 7' N.$, longitude $85^{\circ} 5' E.$ Thermometer 84, Barometer 29.4.

1st June.—Heavy gales W. S. W. and hazy weather throughout. Noon latitude $11^{\circ} 45' N.$, longitude $84^{\circ} 23' E.$ Thermometer 85° , Barometer 29.3.

2nd June.—Heavy gales W. S. W. Towards midnight S. W. for a few hours. Noon latitude $14^{\circ} 17' N.$, longitude $83^{\circ} 34' E.$ Thermometer 85° , Barometer 29.2. Under close-reefed top sails for the last two or three days.

3rd June.—Fresh gales W. S. W. and S. W. Latitude $16^{\circ} 34' N.$ longitude $82^{\circ} 53' E.$ 4 P. M. made land about Coringa, wind South.

4th June.—Steady breezes. Latitude noon $17^{\circ} 50' N.$, longitude $84^{\circ} 0' E.$

Abridged Log of the Ship MARK PALMER, Capt. Blenkinsop, bound to Calcutta, reduced to civil time.

Wednesday, 1st June.—She was at Noon in $3^{\circ} 49'$ N., longitude $82^{\circ} 25'$ E., with a strong S. W. by W. breeze and clear weather, with all sail set. To midnight the same, wind S. W. by S.

2d June.—The same fair monsoon at S. W. with hazy weather from noon; latitude $6^{\circ} 39'$ N., longitude $85^{\circ} 14'$ E. continuing till midnight.

3d June.—A. M. the same. Noon latitude $10^{\circ} 8'$ N., longitude $85^{\circ} 42'$ East; arrived off *Jaggernath* by 7 P. M. carrying fine monsoon throughout.

Abridged Log of the Ship JESSIE LOGAN, towards Calcutta, reduced to civil time.

31st May.—At noon latitude $2^{\circ} 48'$ N., Barometer 29.84, Thermometer 84. P. M. fine clear weather, wind W. S. W., 8 knot breeze.

1st June.—Fresh and squally, wind W. S. W., latitude $6^{\circ} 14'$, Barometer 29.62. Thermometer 85. P. M. strong breeze S. W. preparing for bad weather, heavy cross sea. Midnight finer, made more sail.

2nd June.—A. M. light winds to noon. Latitude $7^{\circ} 55'$. Barometer 29.75. Thermometer 87° . P. M. variable, and S. W. at 10 P. M. when squally and blowing fresh.

3d June.—A. M. to noon strong breezes S. W. Noon latitude $10^{\circ} 60'$ N. Barometer 29.60.

I was unable to obtain the longitudes to this vessel's log, but they are of little importance, as she was doubtless about on the usual track.

Abridged Log of the Bark JULIET, bound to Calcutta, reduced to civil time.

1st June.—Strong breeze W. S. W. (8 and 9 knots,) and fine weather. Noon latitude $4^{\circ} 26'$ N., longitude $85^{\circ} 0'$, the same till midnight.

2d June.—A. M. the same wind W. S. W. and fine, 8 and 9 knots. Noon latitude $89^{\circ} 57'$ N. longitude $85^{\circ} 12'$ E. P. M. the same.

3d June.—The same. Noon latitude $13^{\circ} 21'$ N. longitude $84^{\circ} 40'$.

4th June.—The same, latitude $16^{\circ} 48'$ N. longitude $85^{\circ} 0'$.

Abridged Log of the Bark AUGUSTUS, Captain G. Purchase, from Mauritius to Calcutta, reduced to civil time.

27th May.—Noon latitude $18^{\circ} 45'$ N. longitude $85^{\circ} 35'$ E. Moderate breezes, 2 and 3 knots and cloudy. Barometer* 29.54, Thermometer 89° . P. M. to midnight light and variable winds. S. W. to S. E.

28th May.—9 A. M. wind Easterly and light. Noon latitude $19^{\circ} 16'$ N., longitude chronometer $85^{\circ} 53'$ E. Barometer 29.58. S. Westerly current. P. M. variable E. by S. to S. E. at 7, but then increasing a little. 5 P. M. saw Manickapatam Pagoda bearing N. W. by N. Midnight light airs.

29th May.—4 A. M. calm, saw Black Pagoda N. N. W. five leagues. Noon light breezes and clear, latitude $19^{\circ} 39'$, longitude chronometer $86^{\circ} 18'$, Barometer 29.57; slight Northerly current. P. M. moderate N. E. to E. by N. and N. E. winds. 8 P. M. cloudy, lightning to Southward and N. N. W. Midnight light winds and clear.

30th May.—4 A. M. moderate N. N. E. breezes and clear, increasing to five knots at noon, very cloudy to the S. E. with thunder. Latitude $19^{\circ} 1'$, longitude chron. $86^{\circ} 39'$ E. Barom. 29.34, strong S. Westerly current. 1 A. M. squally N. N. E. At 5, North, at 9, N. E. heavy squalls and showers towards midnight.

31st May.—4 A. M. the same weather; 6 A. M. fresh gales; close reefing. Noon more moderate. Wind from 5 A. M. to noon N. N. E. to N. E. Latitude $18^{\circ} 38'$ N., longitude chron. $87^{\circ} 17'$ East, Barometer 29.23. P. M. wind N. E. veering to E. by N. At 7 A. M. strong breezes, heavy squalls and much lightning.

1st June.—A. M. wind E. by N. and weather as before. At 11, wind N. N. W. strong breezes and cloudy. Latitude $19^{\circ} 18'$ N. longitude

* Captain Purchase having favoured me with a comparison, his Barometer is corrected to that of the Surveyor General's Office by subtracting $0^{\circ} 16'$ from its indications.

86° 23' E. Barometer 29.19' P. M. fresh gales and heavy squalls N. N. W. At 11 P. M. N. W. by N. strong gales, much lightning, and heavy rain.

2d June.—6 A. M. wind N. W. At 9 and to noon W. by N. dark cloudy weather, strong gales and much rain. No observations. Barometer 29.24. P. M. the same; under close reefed top-sails. 1 P. M. wind West. At 7 P. M. wind W. S. W. to S. W. at midnight, when fresh gales and cloudy.

3d June.—4 A. M. the same soundings, 26 fathoms mud; 6, saw the Black Pagoda N. W. Noon False Point Light House N. W. 4 or 5 miles. Barometer 29.30. P. M. wind W. S. W. Fresh breezes and fine to the Pilot.

Abridged Log of the Barque PANTHEA, Captain Marman, bound to Calcutta, reduced to civil time.

Sunday, 29th May.—3 A. M. to noon calm. Latitude 18° 54' N. P. M. to midnight light Northerly winds.

30th May.—A. M. to noon, light Northerly winds. Latitude 18° 57'. N. P. M. Northerly breezes with hazy weather, and some lightning.

31st May.—N. N. E. winds freshening. Noon no observations. P. M. freshening to a heavy gale from N. N. E. 2 P. M. hove to under close reefed main top-sail, heavy sea from the Eastward.

1st June.—Gale continuing from midnight. Noon no observations. P. M. wind veered round to the Westward. Blowing hard at West.

2d June.—A. M. moderated; daylight bore up and made all sail. Wind W. S. W. course N. by W. P. M. wind S. W. course, N. E. by E., moderate breeze, 5h. 30m. P. M. saw Ganjam bearing W. N. W; 10, a heavy squall from N. W.

3d June.—A. M. fine. Noon latitude 20° 8' N.

Abridged Log of the Barque JOHN WILLIAM DARE, Captain Ross, from Calcutta bound to Penang, reduced to civil time.

26th May 1842.—The John William Dare left the Pilot at 2 P. M. on the 26th May. At 8 P. M. the outer light bore N. W. $\frac{3}{4}$ N. working to windward with light variable breezes.

27th May.—Light airs to noon, when latitude $20^{\circ} 38' N.$ P. M. light one and two knot breezes S. S. E., S. by E., and S. E. to midnight.

28th May.—Calms and clear weather, current to the N. E. at the rate of two miles per hour. Noon latitude $20^{\circ} 32' N.$ P. M. light airs to midnight with cloudy weather.

29th May.—Light breeze from N. E. at 8 A. M. Noon latitude $29^{\circ} 46' N.$ Barometer 29.50. P. M. moderate breeze N. E. by E. freshening to midnight, when going six knots.

30th May.—Moderate 6 knot breeze, N. E. by E. to noon and squally; latitude $17^{\circ} 56'$, Barometer 29.50 and falling. P. M. fresh breezes N. E. and squally, increasing to a gale at S. E. by E. at 6 P. M. At 12, S. S. E. heavy cross sea. Barometer at 6 P. M. 29.30; at 8, hove to.

31st May.—2 A. M. wind about South, 6 A. M. a little more moderate, 10 increasing again. Noon no observations, wind about South. No observation, Barometer 29.20. 1 P. M. wind S. W. by S. 11 P. M. S. by W. 7 P. M. more moderate, heavy cross swell from W. S. W. to midnight.

1st June.—2 P. M. heavy squalls and heavy S. W. swell. 10 A. M. bore up; ship being leaky and lascars worn out. Noon no observations, Barometer 29.10 and falling. P. M. wind W. N. W. increasing gale, hove to again. Midnight heavy weather. Barometer 28.80.

2d June.—A. M. wind W. N. W. fresh gales and heavy squalls. No observation; current (or drift) three miles per hour. Barometer 29.0. P. M. fresh gales W. N. W. and dark hazy weather to midnight. Barometer 29.00.

3d June.—A. M. made a little sail. At 7, wind S. S. W. Noon no observations. P. M. fresh gales S. W. and cloudy.

4th June.—A. M. to noon the same weather, wind about S. W. by S. latitude $19^{\circ} 12' N.$ longitude $90^{\circ} 33' E.$ Barometer 29.10. P. M. wind S. S. W. to midnight.

5th June.—Noon latitude $20^{\circ} 0' N.$ longitude $89^{\circ} 3' E.$ reached the Pilot station at 10 A. M. on the 6th.*

* The Brig *Moulmein*, Captain Pratt, from Singapore to Madras, had light winds and fine weather in latitude $4^{\circ} 24' N.$ to the East of Acheen Head on the 29th May. On the 30th, a heavy North-westerly swell with Diamond Point W. N. W. Variable winds and calms on the 31st, and from 1st June, beat through the Bengal passage against a strong S. W. Monsoon, which lasted through the 2nd and 3rd June.

Letter from Captain Buckton, commanding Brig "ALGERINE."

SIR,—Upon perusal of the "*Englishman*" of the 6th instant, I observe your request, "for any information respecting the late storm," that this city has been visited with.

Should my observations upon the extraordinary weather, which I encountered in the Bay of Bengal, between the 19th May and 4th June, tend to throw any further light upon the Law of Storms than is at present known, I shall feel glad that the constant attention which I paid to the signs of the weather, and the indications of a most excellent Marine Barometer (by Troughton and Sons,) will have slightly availed the interests of science.

The 18th May, in latitude $8^{\circ} 5'$ N. longitude $97^{\circ} 50'$ E. commenced with light Westerly winds, increasing towards midnight with thick cloudy weather. At 9h. 30m. A. M. experienced a very heavy squall from the N. W., with torrents of rain, loud peals of thunder and vivid forked lightning; the electric fluid struck on the wet deck, hissing as it bounded forward and over to leeward; and the force of the wind so great, that, although every sail was furled, we lay lee gunwale under. This squall lasted until near noon, and was succeeded by a fresh breeze from the Westward, and which continued with thick cloudy weather until noon of the 23rd, when, in latitude $6^{\circ} 16'$ N. longitude $97^{\circ} 20'$ East, the wind gradually veered round to S. W. and W. S. W. increasing to a double reefed topsail breeze, carrying us into latitude $8^{\circ} 50'$ North, longitude $93^{\circ} 35'$ East; during the whole of the time the Barometer ranged between 29.20 down to 29.0. At 3 A. M. of the 26th, the wind drew round to W. by S., blowing strong, with a high confused sea. Barometer down to 28.80, latitude $9^{\circ} 20'$ N., longitude $93^{\circ} 11'$ East; at 2 A. M. 27th, the wind suddenly veered round in a heavy squall to N. W., then to N. E., and back again to N. N. W., with very heavy rain, little thunder, but most vivid and constant lightning; the Barometer falling to 28.70, latitude $9^{\circ} 26'$ N., longitude $92^{\circ} 35'$ E.

On 28th, in latitude $10^{\circ} 0'$ N., longitude $92^{\circ} 26'$ East, the sky became a perfect dense mass of black clouds with the scud flying rapidly past from N. E., S. E., and W. S. W., the wind light, and

the sea rising in bubbles, as if the wind was blowing from every point of the compass, hissing and rising up in bubble like a boiling cauldron. Here the Barometer fell to 28.60 ; this being excessively low for so low a latitude, induced us to make every preparation for severe weather. From this time until the 1st June, latitude $15^{\circ} 25'$ N., longitude $87^{\circ} 58'$ E. experienced an increasing gale steady from S. S. W. to S. W. by W. with much lightning, and a very heavy appearance all round. The Barometer rising and falling according to the strength of the squalls, or the preponderance of rain from $28^{\circ} 70'$ to $28^{\circ} 56'$. On the 2nd, (civil time,) the gale increased so as to oblige us to lay to, the Barometer having fallen to 28.45, (latitude $17^{\circ} 20'$ N., longitude $87^{\circ} 6'$ E.) At 9 A. M. experienced a cross sea, setting in from S. W., N. W., and N. E., the former preponderating ; the rain pouring down in torrents, the gale increasing, and the squalls blowing with fearful violence from W. S. W. and shifting suddenly from that to N. W., N. N. W., and as far as North ; the Barometer gradually falling until it came down to 28.18 ; at midnight more moderate, the Barometer up to 28.36. Steady gale from S. W. by W. decreasing towards noon. 3 P. M. when latitude $19^{\circ} 10'$, longitude $86^{\circ} 42'$, so as to enable us to make sail until 11h. 30m. P. M. of Friday, when the Barometer again fell to 28.20 during a most severe squall from N. W. False Point was then bearing about N. W. 12 miles ; here we were obliged to stand to the S. Eastward for two hours, when we again made sail, and on the following night, at 10 P. M. we were anchored off the tail of Saugor Sand, the wind very steady from S. Westward and decreasing, the Barometer having risen to 28.50. From this time until our arrival at Calcutta, on the morning of the 7th, we had fresh breezes from S. W. mostly ; the Barometer rising to 28.85.

CHARLES BUCKTON,
Commander of the Brig Algerine.

Abridged Log of the Barque ARIEL, Captain Burt, from Singapore bound to Calcutta, reduced to civil time.

The *Ariel* passed the Nicobars on the 21st and 22d May, working against a strong monsoon until the 26th May, when she was at noon

in latitude $10^{\circ} 49'$ N. longitude per chron. $90^{\circ} 30'$ E. Barometer 29.69*. Thermometer 85° . Increasing S. W. breezes and cloudy weather. P. M. strong monsoon. At midnight increasing breeze S. W. and very squally.

27th May.—7 A. M. steady breeze S. W. Noon strong monsoon and cloudy. Latitude account $12^{\circ} 47'$ N. longitude $89^{\circ} 07'$ E. Barometer 29.56. Thermometer 89° . P. M. moderate breezes W. by S. but squally appearances. At 8 P. M. light breezes, and cloudy at midnight.

28th May.—Daylight fresh breezes and cloudy, wind variable. At 8 A. M. a severe squall, and the wind shifting suddenly from N. E. to West, ship was taken aback and thrown on her beam ends. Lost the gig and several sails. At 10, squall abated. Noon, continued heavy squalls, with thunder, lightning and heavy rain. *Wind continually veering*, (it is not noted between what points,) and a troubled sea on. No observation. Latitude account $13^{\circ} 57'$ N. longitude $89^{\circ} 42'$ E. Barometer 29.49. Thermometer 89. P. M. severe, heavy, continued squalls, with thunder, lightning and rain. Barometer from 29.49 to 29.59, wind veering from N. E. to N. W. and West, preparing for bad weather; sunset more moderate; midnight strong winds and variable, as before.

29th May.—Daylight strong gales with heavy rains and a heavy sea; noon the same, with continued squalls, thunder, lightning and rain; wind marked as variable from North to West. Latitude account $13^{\circ} 59'$ N. longitude account $90^{\circ} 7'$ E. Barometer 29.44. Thermometer 88° P. M. the same, moderating at intervals, but increasing again; wind from West to W. by S. and W. S. W. at midnight.

30th May.—Daylight hard gales W. S. W. and heavy rain; noon more moderate. Latitude observation $13^{\circ} 39'$ N. longitude $88^{\circ} 58'$ E. Barometer 29.41. Thermometer 86. P. M. lying to under storm staysails; wind W. S. W.; midnight more moderate, and sea considerably fallen.

31st May.—Daylight moderate W. S. W. At 8, a severe squall. Noon strong gale. Latitude account $14^{\circ} 01'$ N. longitude account $89^{\circ} 13'$. Barometer $29^{\circ} 38'$. Thermometer 86° . P. M. strong gale and very heavy squalls at times. Barometer still at $29^{\circ} 38'$, lying to under storm staysails. Midnight clearing a little.

* Corrected by comparison with that of the Surveyor General's Office.

1st June.—Daylight strong steady gales S. S. W. ; 9, severe squalls. Noon strong gales. Latitude account $14^{\circ} 37'$ N. longitude $89^{\circ} 18'$ East. Barometer 29.41. Thermometer 85° . P. M. strong gale to midnight, wind about S. S. W.

2d June.—Daylight weather as before ; wind apparently West to S. S. W. Noon moderating. Latitude observation $15^{\circ} 03'$ N. longitude $89^{\circ} 02'$ E. Barometer 29.38. Thermometer 84° . P. M. to midnight strong gales S. W., but less sea.

3d June.—Daylight the same, more sea. Noon latitude $16^{\circ} 21'$ N. longitude $87^{\circ} 29'$ E. Barometer 29.31. Thermometer $89\frac{1}{2} 7'$. P. M. to midnight strong gales S. W. going from 5 to 8 knots N. W.

4th June.—Noon latitude $18^{\circ} 44'$ N. longitude $85^{\circ} 56'$ E. Barometer 29.34. Thermometer 92. Fine weather. At 4 P. M. saw Ganjam, and hence had the usual variations in the monsoon at this season to the Pilot.

Abridged Log of the Brig ARETHUSA, Captain Jas. Clarke, from Calcutta towards Madras, reduced to civil time. Forwarded by Captain Biden.

30th May.—P. M. strong breezes from the S. W. and cloudy weather, with a heavy swell are noted, increasing at sunset, and at 11 P. M. “experienced a heavy fall in the Barometer” is stated, though how much is not said, nor is the Barometer height given.

31st May.—Increasing gales S. W. by W., high sea breaking over the Brig. Daylight strong gales. 10 A. M. more moderate. Noon brisk breezes and strong gales. Latitude observation $14^{\circ} 20'$ N., longitude $84^{\circ} 29'$ E. P. M. strong gales S. W. by W. and high sea. At 6, wore ship to the W. N. W. having hitherto been standing to the S. S. E. Midnight the same weather, wind S. S. E.

1st June.—8 A. M. weather the same. Noon latitude by observation $13^{\circ} 49'$ N., longitude $84^{\circ} 5'$ E., wind W. S. W. from 2 A. M. P. M. strong gales and high sea. Wind S. W. by W. and S. S. W. to midnight.

2nd June.—The same weather to noon, with wind S. W. Latitude $14^{\circ} 22'$ N. longitude $83^{\circ} 24'$ E. moderating a little. Midnight varying to South.

3rd June.—Same weather, wind from S. S. W. to S. W. at noon, Latitude $14^{\circ} 21' N.$ $82^{\circ} 53' E.$

This vessel's log is given for 4th, 5th and 6th, but it is evident, as by the foregoing extracts, that she had only a heavy monsoon.

Abridged Log of the Barque NORFOLK, Captain ——— from Calcutta to Mauritius, civil time.

27th May.—Noon latitude $20^{\circ} 15' N.$ longitude $88^{\circ} 54' E.$

28th May.—At noon latitude $19^{\circ} 40' N.$ longitude $88^{\circ} 5' E.$ Light winds, and fine till midnight.

29th May.—At 8 A. M. increasing winds N. E. Noon latitude $18^{\circ} 32' N.$ longitude $87^{\circ} 15' E.$ Steady breeze N. by E. to midnight, when squally with passing showers.

30th May.—At 8, increasing winds N. N. W. At noon N. W. latitude $17^{\circ} 00'$ longitude $87^{\circ} 00' E.$ going 6 knots to the S. $\frac{1}{2}$ W. 2 P. M. heavy squalls from the N. W. increasing to midnight; preparing for bad weather.

31st May.—A. M. strong winds and heavy squalls N. W. 6 A. M. more moderate. Noon brisk wind, varying from West to North* till midnight. Latitude at noon $15^{\circ} 20' N.$ longitude $88^{\circ} 10' E.$ Midnight cloudy with squalls.

1st June.—A. M. wind marked S. W. Strong breeze and cloudy, with a heavy swell from the S. W. Noon squally. Latitude $14^{\circ} 35' N.,$ longitude $89^{\circ} 25' E.$ Midnight brisk gales and cloudy.

2nd June.—Throughout brisk gales S. W. and cloudy. Noon latitude $15^{\circ} 10',$ longitude $88^{\circ} 40' E.$

SECTION II.

Eastern Shores of the Bay, with Burrisal and Dacca.

Dr. Hinton, Civil Surgeon of Akyab, in an account of the storm of the 14th and 15th May, on the Eastern shores of the Bay, which with that of December 1841, will form the subject of another memoir now in preparation, sends the following memorandum relative to that of June, which we are now investigating.

“ Since writing the above, I have seen in the *Englishman* a notice

* So in the log.

of the severe storm in Calcutta, on the 3rd June, which was not felt here, but about forty miles to the southward, in Combermere Bay, a large row-boat was capsized owing to a tremendous sea, compared by one who experienced it, and was well able to judge, as equalling the sea off the Cape of Good Hope. A second row-boat being in company, went to the assistance of the drowning men, and through the strenuous exertions of W. D. Brown, Esq. not only were nineteen lives saved, but the boat righted and brought into Akyab harbour. The following is Mr. Brown's note :—

Abstract of the Weather from 1st to 5th June 1842, drawn up by W. D. Brown, Esq. Marine Assistant to the Commissioner of Arracan at Kyook Phyoo, 1842.

1st June.—For several previous days weather very oppressive, sky overcast. Barometer unsteady.

2d June.—Daylight Barometer 29.60. Thermometer 82°. 9 A. M. left Kyook Phyoo in a row-boat for Akyab, wind blowing fresh from the S. W. with rain. 11 A. M. passed Cape Elizabeth, heavy sea on ; 11h. 30m. wind came round in a heavy squall to the N. W., took in almost every foot of sail, the sudden and violent change of wind caused a tremendous sea, requiring two men to steer. 1 P. M. running for Nundigree Creek, overtook another row-boat which had left Kyook Phyoo two hours in advance of me, found her capsized with nineteen men on her bottom, saved them, righted and baled her out, and brought to for the night in the channel. Midnight blew very heavy from W. and W. S. W. all night.

3d June.—Daylight went in search of ten of the crew of the capsized boat, wind blowing strong from W. S. W.; after some time, found them, having swam to two islands on spars, &c., then proceeded on with wind right aft up the Kenain-known passage, with a succession of squalls and rain all day, and anchored at evening.

4th June.—Daylight made sail, and crossed Hunter's Bay, where the sea resembled the surf at Madras during a gale, and ran up the Meabong Channel ; squalls and rain having continued all day, and anchored at evening.

5th June.—Daylight strong westerly winds with rain. 7h. 30m. A. M. very heavy squall. 7h. 45m. weighed, and reached Akyab at 8h. 30m. A. M.

Chittagong.

From Chittagong I have been favoured by R. Trotter, Esq. B. C. S. with the following letter and register; and in reply to some enquiries, with the note which follows the register:—

“ I have the pleasure to send you the accompanying Table, containing a few particulars regarding the state of the weather here during the late hurricane in Calcutta. I find my Sympiesometer a very delicate instrument, indicating approaching changes. It fell to 28.70 during the violent squall on the 3d, about 3h. 30m. p. m.

June.	Sympie- someter by Adie at 9 A. M.	Barometer by Dollond 9 A. M.	Rain Gages.			Wind and Weather.	
			Mr. Sconce's.		Mr. Trotter's		
			9 A. M. to 9 P. M.	9 P. M. to 9 A. M.	9 A. M. to 9 A. M.	A. M.	P. M.
Wed. 1	Ther. 82.6 28.81	Ther. 82 30.206	.... ....		Inches. 0.00		
Thurs. 2	82.4 .80	81 .210	Total. 0.36		0.00	Cloudy. S. E.	Westward to South.
Fri. 3	80 .76	79 .200	.92 2.27 Total. 3.19		0.469	S. Ely. Rainy. Stormy.	S. Westerly, rainy, at 3 30 P. M. a very violent squall from S. W. much rain.
Satur. 4	80.4 .82	79 .202	.07 .75 Total. .82		2.968	Stormy. Sty.	South & S. Westly. at night, after blow- ing from S. W. a heavy squall from N. W.
Sun. 5	80.8 .90	78 .202	Total. .98		4.483	Ditto.	Heavy rain from W.
Mon. 6	80 .88 *	79 .200 †	.94 .18 Total. 1.12		1.666	S. Ely.	South & S. Westly.
			Rain Gages. by Dollond.				

* The attached Thermometer stands 2° higher than the above observations.

† The Barometer stands about 2-10th below the standard in Calcutta.

N B. I cannot account for the great difference of the results of the Rain Gages; that used by me is a plain tin box, of which the cubical contents are ascertained. The observations of 4th and 5th were checked by actual measurement.

Noacolly.

Dr. BAKER, Civil Surgeon of Noacolly, latitude 22° 48' N. longitude 91° 04' E. has forwarded to me the following report.

I have the pleasure to furnish you with the following remarks on the state of the weather in this quarter, about the period of the occurrence of the late gale in Calcutta and its neighbourhood :—

Towards the end of May, the heat had been very oppressive. Therm. 91° at the highest range, being higher by one degree than I have ever observed it during a residence of many years at this station; the atmosphere exhibited that white hazy appearance, which, as you observe, is noticed in conjunction with earthquakes, and a similar observation was made here regarding it.

On Friday night the 3d instant, it began to blow from the Eastward, and continued increasing until it blew “half a gale” during the 4th and 5th, the wind gradually veering round to the S. E., from whence it continued steady for the last two days, when it subsided. The weather was squally and attended with rain, not very heavy, and at no time could it be said to blow a complete gale, nor had we any inundation.

I am sorry that I cannot give you the Barometrical changes, not being furnished with the necessary instrument; nor did I take any precise notes on the state of the weather during the period in question; but I can vouch for the general accuracy of the above statement, from which it would appear, that the centre of the gale was far to the West of this station. Noacolly is situated about four miles from the North shore of the great embouchure of the “Megna,” and opposite to the Island of Hatteah. My correspondents at Chittagong say nothing of the gale in that quarter. Burrisaul is due West from Noacally, distance about fifty miles.

NOACOLLY, (BULLOOAH,)

15th June, 1842.

J. BAKER,

Civil Surgeon.

In reply to some inquiries, Dr. Baker adds as follows :—

“I regret that I am unable to give the precise information which you require, relative to the changes of the wind. I can only state generally, that it commenced from the East, and the E. by South, blow-

ing pretty steadily from that quarter during the first two days, then veering to the S. E. and South gradually, as I mentioned in my former communication. There was nothing so remarkable in the violence of the weather, as to attract my particular attention to minutiae; had it blown a gale, I should have been more minute in my observations. I think, from the dates I gave you, the stormy weather must have set in earlier by two or three days here than it did in Calcutta, and continued for a longer period, lasting with us three days. I hear there was only a squall or two felt at Chittagong about the period, so that apparently the gale, did not extend very far to the Eastward. At Burrisaul, West of this place, it appears to have been more violent. At Chittagong, to the East, more moderate than here."

Burrisal.

From Burrisal, Mr. INCE of the Salt Agency, has obliged me with the following remarks, made by himself and a friend at that station:—

"For several days the heat had been very great. On the 31st May 1842, we had rain, which cooled the air a little; a strong wind all day from the Eastward.

1st June.—Heavy rain with squalls from S. E., towards evening it got more to the East, and blew very hard all night, not much rain.

2d June.—Still blowing a perfect gale from the East with drizzling rain; continued so all night.

3d June.—At $\frac{1}{2}$ past 2 in the morning, the wind got to E. S. E. and blew fearfully, river rose to within a few feet of the Bund; compounds nearly under water, every appearance of an inundation; towards evening it became milder, and the wind appeared inclined to settle at due South, but during the whole night the gale continued, but not quite so violent.

4th June.—Wind at South, but still very high, tremendous gusts during the whole night.

5th June.—Wind still very high, getting more to the Westward.

6th June.—Clearing up, but wind still very high; a vast deal of damage has no doubt been done, but *all* the reports have not yet come

in ; fortunate it was that it did not occur during the springs, for with the strong Easterly wind, nothing could have saved us from inundation.

We have since had some very heavy rain, particularly on the 10th."

Dacca.

From Dacca the only Report I have obtained, was sent me by an anonymous Correspondent, who will I hope, accept my best thanks for it.

"In case no fuller account of the late storm, as experienced at Dacca may have been received, the following remarks I made at the time are forwarded for Mr. Piddington's use. The storm was not in any way so violent at Dacca, as it appears to have been in Calcutta. As letters from Chittagong, of the 5th, make no mention of any storm, it probably did not extend much further to the Eastward.

3d June.—Heavy rain, wind East, but not particularly strong. Thermometer at 10 A. M. 80°, and air cool.

4th June.—Wind from South East and South, very strong in gusts, continued rain and heavy squalls. Thermometer 83° at 10 A. M.

5th June.—Wind from South, and more moderate, continued rain, Thermometer at 10 A. M. 84°. At half past 3 P. M. wind changed to South West with a violent squall, the wind stronger at this time than at any other period during the storm. Wind returned in a very short time to the old quarter, or South East, stormy night with heavy rain. Monday, wind abated S. S. West. Thermometer at A. M. 80°. It will be observed that the storm did not reach Dacca till the 4th, and that though the rain continued without intermission, the temperature of the air increased, instead of becoming cooler, as would have been the case under ordinary circumstances. The wind came round by the *South*.

SECTION III.

On the Western Coast of the Bay, from Madras to Kedgerree, we have the following data.

MADRAS BAROMETRICAL REGISTER.

Extracts from the Meteorological Journal, kept at the Madras Observatory, Fort St. George.

Date.	Barometer.			Thermometer.		
	8 A. M.	4 P. M.	10 P. M.	8 A. M.	4 P. M.	10 P. M.
1842.						
May 28th	29.876	29.742	29.776	92.6	92.4	89.5
„ 29th	29.776	..	29.736	87.2	..	90.0
„ 30th	29.752	29.670	29.742	87.5	92.7	92.0
„ 31st	29.752	29.668	29.732	89.0	92.8	90.8
June 1st	29.718	29.616	29.674	88.5	96.3	92.2
„ 2d	29.708	29.610	29.672	90.1	94.3	91.2
„ 3d	29.718	29.616	29.670	89.0	96.3	92.4
„ 4th	29.736	29.638	29.626	88.6	96.7	88.3
„ 5th	29.506	29.322	29.364	90.0	90.8	88.1

(True Copy,) CHAS. BIDEN.

At Covelong the weather, by the Log of the Ship *Ino* of Whitehaven, was fine.

The Brig *Futteh Rohoman*, lying in Poondy Road, between Ganjam and Manikpatam, (latitude about 19° 35' N.) experienced on the 1st, 2nd, and 3rd June, strong W. N. W. breezes, preventing her from receiving cargo.

From DR. CUMBERLAND, *Civil Surgeon, Pooree.*

I have the pleasure to send you an account of the weather experienced at Pooree, during the latter part of May, and the early part of the present month. I regret it is not in my power to add the barometrical changes, as I have no instrument.—N. B. The observations were made about 400 yards from the sea.

22d May.—Commenced with the usual strong S. W. breezes prevalent at this season at Pooree. The weather was sultry, Therm. 90°.

At 5 P. M. heavy clouds accumulated in N. W. At $5\frac{1}{2}$ P. M. wind N. W. Therm. 84° . At $6\frac{1}{2}$ P. M. wind suddenly shifted to S. W. and blew for half an hour, as if from a furnace, it was so hot; and the thermometer rapidly rose to 90° . A few drops of rain fell.—(N. B. To the S. W. was the open sea about 400 yards off.) The wind then continued variable for about an hour, frequently shifting suddenly in a most remarkable manner, from N. W. to S. W., blowing gently from either quarter for a few minutes. At $7\frac{1}{2}$ P. M. the clouds broke, and the threatened storm appeared to pass away to the Northward; the usual cool S. W. breeze succeeding the hot one, changing however during the night to S. E. From this time until the end of the month, the weather was generally sultry and oppressive; the highest range of the thermometer was $90^{\circ} 25'$, the lowest 79° ; the winds were variable, but chiefly from S. E. during the day, with squalls from N. W. in the evening, and the nights calm. Thunder and lightning, but no rain, accompanied the squalls until the 30th and 31st, when nearly an inch of rain fell. On the last day, the wind was from the N., and the sky overcast.

1st June.—Wind from N. cloudy, rain, lightning; rain 0.10. Thermometer 83° , lowest 79° .

2d June.—Wind N. to N. W. cloudy, rain 0.20. Thermometer 83° , lowest 78° .

3d June.—Cloudy, wind from N. W. to S. W. at night calm, and towards morning S. W., rain 0.10. Thermometer 87° , lowest 84° .

4th June.—Cloudy, wind S. W. At 7 P. M. thunder, lightning, and rain from N. W., rain 0.05. Thermometer 90° , lowest 82° .

5th June.—Early part of day, wind N. W. with rain. At 10 A. M. S. W. cloudy, fresh breeze. At 4 P. M. blowing almost a gale. At 6 A. M. moderate, rain 0.30. Thermometer 87° , lowest 83° .

6th June.—Wind S. W. rain at 6 P. M. heavy squall from N. W. with thunder, lightning and rain. Thermometer 86° , lowest 76° , rain 0 inches 85 tenths.

7th June.—S. W. cloudy, at night N. W., rain 0.05.

I may here remark, that the surf has been higher during the present month, than I ever witnessed it before at this season. The above may be useful, as shewing the extent of the storm which did so much damage in Calcutta on the 3d instant. During the night of the 3d,

when the storm was at its highest with you, we were *luxuriating* in a sultry calm.

R. B. CUMBERLAND.

From A. MINTO Esq. C. S., Cuttack.

I scarcely should have thought it of any use to forward the few imperfect remarks about the weather on the early part of this month, as noted by me; but as you expressed a wish to procure all the information possible, I give you mine, such as it is.

1st June.—Continued rain nearly all day, calm.

2d June.—Partial heavy showers, calm.

3d June.—Partial heavy showers; during the night rain fell heavy, with strong wind from the Southward, which did not continue above an hour.

I may observe, that the wind was considered by me merely a puff, such as frequently accompanies falls of rain; I was in bed at the time, and thought it uncommon; the hour I should say was about midnight.

A. MINTO.

The following is the Report from Balasore by the Master Attendant.

I beg leave to forward a copy of my log kept at Balasore. We have had no gales, but a good fall of rain; only a slight Bank was perceptible to the Eastward on the 31st May.

		9. A. M.	3 P. M.	5 P. M.
28th May, 1842,	{ Barometer,	29.69	29.65	29.60
	{ Thermometer,	88°	90°	89½°

No wind, air very oppressive at A. M.; light airs from S. E. P. M.

29th May,	{ Barometer,	22.70	29.64	29.60
	{ Thermometer,	88½°	90¼°	90°

Very close indeed, as yesterday, and slight airs from N. E. and cloudy.

30th May,	{ Barometer,	29.63	29.60	29.58
	{ Thermometer,	88½°	89½°	89°

Slight air from N. E. with heavy clouds to Eastward, wind changing to S. E. P. M.

31st May,	{ Barometer,	29.54	29.50	29.48
	{ Thermometer,	86°	84°	84°

N. Easterly winds, with cloudy weather and rain throughout.

1st June,	{ Barometer,	29.40	29.37	29.36
	{ Thermometer,	82°	83°	82 $\frac{3}{4}$ °

Wind from N. E. to N. W., with heavy rain throughout, and very heavy clouds.

2d June,	{ Barometer,	29.33	29.28	29.27
	{ Thermometer,	82°	82 $\frac{1}{2}$ °	81°

Wind from N. W. with heavy rain and gusts of wind throughout, with low flying clouds.

3d June,	{ Barometer,	29.25	29.25	29.23
	{ Thermometer,	81 $\frac{1}{2}$ °	81 $\frac{1}{2}$ °	82°

Wind N. E. to N. W., with heavy rain and gusts of wind 5 P. M.; at 10 P. M. wind from S. W. in strong gusts, a double reefed topsail breeze with rain throughout.

4th June,	{ Barometer,	29.32	29.29	29.29
	{ Thermometer,	82°	84°	83°

Clearing up, wind S. W. rather Southerly inclined at times, with rain in passing clouds.

N. B.—Barometer always ranges lowest at 5 P. M. and about that time indicates a change or otherwise; on the 5th Barometer 29.50, Thermometer 84°.

A. BOND, M. A.

In reply to some inquiries of mine as to the *times* of the changes of the wind, Mr. Bond says, “ I have the pleasure to enclose the times of change of wind as nearly as possible for the three days required in June; viz. 1st, 2nd, 3rd.”

1st June 1842.—Wind N. E. till $\frac{1}{2}$ past 5 P. M., when it changed to N. W. with heavy rain throughout, and heavy clouds, remaining rather stationary from N. W.

2nd June.—Wind N. W. and rather more Westerly inclined towards evening, with strong gusts of wind, and heavy rain throughout, and low flying clouds from N. E.

3rd June.—Wind at 8 P. M., veering from N. W. to N. E., with heavy rain; at noon wind N. W.; at 2 P. M. W. N. W., and from that time gradually veering round to West; and at 10 P. M. S. W. with very strong gusts of wind; a good double reefed top-sail breeze with rain throughout.

N. B.—After sunset throughout both Monsoons the winds are more Westerly. N. E. Monsoon at sunset veering to North; 3 A. M. N. W.; S. W. Monsoon at sunset veering to South; at 3 A. M. S. W.; the only exception is when it blows strong at the commencement of either of the Monsoons.

H. C. Pilot and Light Vessels.

I have obtained through the zealous aid of my friend, Captain Claperton, Acting Master Attendant, very full returns from all the H. C. Pilot and Light Vessels, which will be found embodied in the general Tabular statement, and duly referred to in the summary at the conclusion.

From A. C. BARWELL, Esq. Salt Agent, Hidgelee.

State of the Thermometer and Sympiesometer kept by a gentleman at this station, from the 1st to the 6th June inclusive.

Date 1842.	Thermo- meter.	Sympie- someter.	Remarks.
	°		
June 1st,	85	29.400	Cloudy and heavy showers all day from E.
„ 2d,	82	.350	Ditto ditto and strong breezes E. and N. E.
„ 3d,	82	.050	Ditto and constant ditto from N. and N. W. varying to S. W.; at 4 P. M.
„ 4th,	80	.350	Showery and clearing up, wind S. W.,
„ 5th,	80½	.550	Squally and heavy showers from S. W.,
„ 6th,	82	.500	Cloudy now and then, drizzling rain S. W.

The gale here, I imagine, was not in violence to be compared with what took place in Calcutta and its neighbourhood, and was attended with very little mischief.

A. C. BARWELL,
Agent, Hidgelee Department.

From Mr. M. P. DYER, H. C. P. S.

The following Remarks were made off Kedgerree, from 29th May to the 8th June, premising that the weather prior to the 29th was extremely close and oppressive, and Thermometer 95° in shade.

Date.	Bar.	Wind.	Remarks.
May 29th,	29.40	S. to N. E.	3 P. M N. E. squall and change of weather.
„ 30th,	29.35	E. to N. E.	Light squalls with rain.
„ 31st,	29.30	N. E.	Squally with rain; threatening.
June 1st,	29.30	N. E.	More moderate.
„ 2nd,	29.15	N by E.	Strong gales, and threatening with heavy rain.
„ 3rd,	28.73	N. W. to W.	Heavy gales with intervals and heavy rain.
„ 4th,	29.00	S. W.	Strong breezes and moderating.
„ 5th,	29.20	S. W.	Moderate, but dull and hazy.
„ 6th,	29.25	S. W.	Do. do. squalls of rain.
„ 7th,	29.35	S. W.	Do. do. do. do.
„ 8th,	29.40 {	N. W. to E. S. E. & S.	{ 4 A. M. heavy N. Wester, and by noon the weather cleared off, and wind S.

The extraordinary feature in this gale is, the strength of it being from the Northward and the Westward, instead of being from the Eastward, as is usually the case; and of course you are aware of the sun being vertical, and moon in apogee, to which, and the extraordinary rarefaction prior, the gale may be attributed; in fact, from the extraordinary lowness of the Barometer and N. E. winds, I, as early as the 31st May, brought my Ship, the *Diamond*, back from Saugor to Kedgerree, where we rode out the gale. It was the shift of wind from N. W. to W. that drove the *Globe* and *Symmetry* from their anchors, as it then blew with great violence. I have no further remark to make, but that the latter part of the gale the Thermometer was down to about 82°.

JOHN DYER,
Master Pilot.

In reply to a letter addressed to Mr. Dyer, as to the times of the change, he says, "The change in question took place from midnight on the 2nd to the evening of the 3rd June, from N. by E. to S. W. eighteen hours."

3rd June.

4 A. M. N. N. W.

8 A. M. N. W.

Noon West

4 P. M. W. S. W. } Hardest part of the gale.

6 P. M. S. W. Moderating.

J. DYER.

SECTION IV.

From Kedgerie to, and at, Calcutta.

The Steamer FORBES was lying at Mud Point, the N. W. extreme of Saugor Island, and Capt. Higgins has obliged me with the following account of the storm there :—

I proceed to give you a few observations relating to the late gale ; but as I unfortunately had no Barometer on board at the time, (or rather it was rendered useless by an accident,) I fear the facts here stated will be of little use to you. During the whole of Thursday the 2nd, it blew strong from the N. E., with occasional squalls of rain, and the appearance of the sky and clouds was continually changing ; at times promising a complete clear-up, and again giving every appearance of a gale. At sunset the wind came to N. N. E. and it rained smartly at times till midnight, when it commenced to blow in squalls at North. At 2 A. M. on the 3rd, we had a *very severe* squall, and from that time the gale increased in force, but blowing very steadily from North. A 10 A. M. the wind came round to N. N. W., still increasing in force, and coming on in squalls, each harder and more furious than the last. Noon, the wind at N. W., awful heavy squalls. 2 P. M. W. N. W. At 4 P. M. wind at West, one of the heaviest ; I think *the* heaviest and longest squall that we had during the whole of the gale. 6 P. M. wind at W. S. W., squalls still *very* heavy, but moderating a little. 8 P. M. wind S. W.

still moderating, but the rain increasing. 10 P. M. wind S. W., but the gale evidently broken. Midnight heavy S. W. monsoon breeze and squalls.

We were steaming between Diamond Harbour and Mud Point on the 2nd; and on the 3rd, the day of the gale, we rode off Mud Point.

From the appearance of the clouds and the direction of the wind on the 2nd, I fully expected the gale would have come on from the Eastward; indeed at sunset on the 2nd, it looked quite fine to the Westward, the sun setting behind a bank of still looking fine weather clouds; and the only appearance of bad weather being from the Northward and Eastward; yet from that very point [the Westward] that looked so promising on the 2nd, did we have the heaviest of the gale the next day.*

JOHN HIGGINS,

Comdg. Steamer Forbes.

Log of the Barque FAIRLIE, Captain Garrett; from Captain Biden.

The Barque *Fairlie*, Captain E. Garrett, left Calcutta at 7 A. M. 2nd June, and was at anchor off Hooghly Point at 7 P. M., having the wind North, and at midnight strong gales and cloudy, with thick rain.

3rd June.—A. M. hard gales North with thick rain, making all snug, and riding with 100 fathoms and 50 fathoms of cable upon two anchors. 3 A. M. wind N. W. 2 P. M. about West, increasing gales. Midnight S. W.: The lowest indication of the Barometer 28.30 is said to have been at 2 P. M. on the 3rd June.

4th June.—A. M. wind S. Westerly heavy gales, moderating at 6 A. M.

At Garden Reach, from 3 to 5 miles south of Calcutta, I have been favoured with the following valuable Notes of the Storm by my friend, WILLIS EARLE, Esq.

I send you a copy of some very rough notes taken at the Gardens on the 2nd, 3rd, and 4th June, which, with one doubtful exception

* Being in the Southern half of the storm circle, Capt. Higgins necessarily had the winds from the Westward; though he *saw* the storm coming in a body from the Eastward, as will be perceived by looking at the Chart.

(an error probably) may be taken, as giving pretty nearly the directions of the gale at the times of observation. I have no Barometer, but a Sympiesometer, (one of Adie's own make, which belonged to the *Duke of York*, that was lost in the May gale of 1833) that is very sensitive, and indicates *relatively*, all the diurnal, &c. changes; but it stands I believe from half an inch to perhaps $\frac{3}{4}$ of an inch below what it ought to do, from defect of fluid I suppose. I have never had the error tested by a standard perfect Sympiesometer.

For instance, this morning at 8h. 43m. A. M. it stood at 29.14 when regulated by its attached Ther., which was at the same time at 81.8, when I suppose a perfect one would have indicated 29.70, or upwards. So you can make the requisite allowances, or if it were in the least worth while, have the error of our Sympiesometer ascertained.

We have so many trees about us, and in and about the Company's Garden opposite to us, that the exact direction of the wind cannot be ascertained. One of our trees, a mahogany one, lies with its head I think somewhere in a S. S. E. direction, opposite Bishop's College; house front standing nearly due North and South.

2nd June, 1842.—Thursday very strong N. E. to N. E. by E. wind; throughout the night cloudy, with some little rain 5 30 A. M. Thermometer outside in the North Verandah under 80°. Inside Thermometer 79° 6', attached to Sympiesometer, which stood at 28.52. At 7 45 A. M. ditto weather with dark lowering clouds in the East. Thermometer 81°, Sympiesometer 28.52. Outside Thermometer 81°. Heavy showers of rain at intervals during the day, and continued high N. E. wind; no rain at night, of moment.

3rd June.—Friday during the early part (night) extremely boisterous wind; half a gale from the N. E.; some slight rain towards the morning. 5 45. A. M. inside Thermometer 79° 5'. Sympiesometer 28.25. 6 30 A. M. continual heavy rain, with high wind from the N. W.;* very dark, no thunder heard; and scarcely any lightning seen during the prevalence, for the last five days, of the N. E. breeze. 7 50 A. M. continued stormy wind N. E. to N. N. E., with occasional rain; at times seems to increase. 9 40 A. M. wind rather more northerly. Stronger with heavy beating rain, and so it has been

* Note by Mr. Earle. I think this is an error, it should be N. E.;

for the last 20 to 25 hours. Ther. attached $79^{\circ} 4'$. Symp. 28.12. 10h. 40m. A. M. Ther. 79° , Symp. 28.04. Wind and rain increasing latterly, and at present it is a veritable gale; though not so violent yet as that of May 1833. 5 A. M. Ther. $79^{\circ} 1'$, Symp. 27.99, gale and storm unabated. 11-40 A. M. Ther. $79^{\circ} 4'$, Symp. 27.92. N. N. E. gale continues, rather increasing, with heavy rain. 11-50 A. M. Thermometer $79^{\circ} 5'$, Symp. 27.85, Symp. still falling. 0 7 P. M. Ther. $79^{\circ} 4'$, Symp. 27.83, gale increasing. Mr. Willis's black Schooner on her beam ends, fear she will be swamped. 0.10 P. M. both Mr. Willis's Schooner and his large (20 tons) Saugor boat sunk at their anchors. 0.25 P. M. Thermometer $79^{\circ} 3'$, Symp. 27.74, or the red fluid sunk into the bend of the tube, its height difficult to read off, but the *upper surface* of the fluid in the bulb stood at 0.30 to 33 P. M. about Symp. 28.12, read off in a rough guess way by the eye. A very raging and furious storm, and which must, I fear, do dreadful mischief to the shipping, boats, &c. 0-37 P. M. rain heavier than it has been, quite obscuring the view, wind seems now N. by W. 0-45 P. M. extremely heavy rain, with continued furious blasts of wind. 0-40 to 45, Thermometer 80° , Symp. 28.13; at upper surface of fluid in the bulb. About near 1 P. M. storm still more violent, Ther. $79^{\circ} 2'$ and surface of fluid in the bulb about Ther. $78^{\circ} 3'$, Symp. 28.135, *breathing as it were, or fluctuating with the blasts.** 1-15 to 1-25 gusts of wind still more furious I think, Thermometer $79^{\circ} 0'$, Symp. upper surface of fluid in the bulb 28.135, to 138. Rain as heavy as before, wind apparently about N. by W. 2-15 P. M., during the last 20 to 25 minutes the storm has abated; the wind just now is only pretty fresh from the N. West, with moderate rain, Symp. as it was. At 4-15 P. M. there has been some rain, wind blowing fresh now from the W. to W. S. W., with some rain. 4-15 Symp. in a fix, unmoveable, or at least unchanged. 4-30 P. M. heavy rain with strong gale from W. S. W. 6-30 to 6-40 P. M. excessively heavy rain with stormy wind from the W. by S. to W. S. W.,

* The italics here are mine. The meteorologist will be struck with the analogy between this remark and that of Professor Barlow upon the water Barometer, as also the remarks of intelligent Captains, which so frequently occur in my Memoirs, and in the works of Mr. Redfield and Col. Reid, on the oscillation of the mercury in the gusts of a storm: see also at p. 978 the log of the Algerine, where this phenomenon is again noticed.—H. P.

afterwards bearing to S. S. W., which gale continued more or less all night, although perhaps raging not so fiercely as it did between 0.30 and 2.0 P. M. Sympiesometer so far as observed up to 10 P. M. and later, seemed still in its fixed low state.

4th June.—Saturday, 6.0 A. M. a stiff gale with little rain, still blowing from the S. S. W. ; and the same, but in greater degree prevailed during the (past) night, and without very heavy rain. 6.30 A. M. Thermometer 78° 6', Symp. 28.64 alive again! 7.5 A. M. Thermometer 78° 7', Symp. 28.66, height of upper surface of fluid in the bulb 28.07, and was during the height of the gale 28.13 to 28.14, as well as I could estimate it by the eye, without applying a rule or scale. 8.15 A. M. Thermometer 80°, Symp. 28.67. 8.15 A. M. strong S. S. W. breeze, little or no rain. Squally and rainy at intervals during the day, with very strong wind from the S. S. W. 7.15 P. M. Thermometer 80° 2', Symp. 28.685, a strong S. W. or S. S. W. wind, with occasional hard squalls or bursts continued throughout the night.

EXTRACTS FROM THE NEWSPAPERS.

The following are the heights of the Glasses during the Gale of the 30th instant, on board the Barque MARGARET THOMPSON, Capt. Thurtell, lying at Calcutta.

Sympiesometer.					Barometer.		
June 2nd,	10	P. M.	28.70		June 3rd,	7 A. M.	28.95
3rd,	7	A. M.	28.35			10	28.70
"	8	"	28.25		"	12	28.50
"	10	"	28.05		"	1 P. M.	28.30
"	11	"	27.80		"	1 30	28.22
"	12	"	27.50		"	3	*28.32
"	0 30	P. M.	27.30		"	5	28.25
"	1	"	27.30		"	7	28.60
"	1 30	"	27.35		"	9	28.80
"	2 30	"	27.40		"	10	28.85
"	5	"	27.60		"	12	28.95
"	6	"	28.00		June 4th,	7 A. M.	29.20
"	7 15	"	28.20				
"	9	"	28.50				
"	10	"	28.60				
"	12	"	28.80				
June 4th,	7 A. M.		29.30				

* 28.22 is probably meant here.—H. P.

Log of the Persian during the Gale.

' *Extract from the Bark Persian's Log, June 3d.*—Commenced with strong N. N. E. winds, dark cloudy weather, and heavy rain. Lying at No. 7, Company's Moorings off Calcutta. Barometer 28.40. Sympiesometer 28.0, had fallen 2-10ths through the night. 10 A. M. increasing to hard gale. About noon a hurricane, the tier ahead adrift, the *Regina* coming into our larboard bow, carrying away jib-boom, and long boat, and sweeping us with her, and dragging the moorings. We drove into the *David Malcolm's* house, carried away the larboard bulwarks, stanchions, &c., and stove the gig. About 1 P. M. it lulled, found the Barometer had fallen 3-10ths to 28.10, Sympiesometer 27.60; got a stream cable ashore and hove taut. 2-30 P. M. light S. W. wind and rain; 3, increasing fast, our bowsprit locked in with *David Malcolm's* masts and another ship's. 4, got clear by letting go, and cutting stays, &c. &c., swung along side the *Warrior*, when the stream cable parted, and we drove up the river striking the ground, till the main rigging caught the *Regina's* cathead; got hawsers from our main and mizen masts to her bow; she being aground, cut the main rigging and swung alongside and lashed. 8 P. M. found the Bar. risen 4-10ths or 28.40, Sympiesometer 28.00, but blowing hard as ever; dark dismal night, with heavy rain. Midnight moderating; glass the same.

' *June 4th.*—Commenced with strong S. W. gales, blowing in squalls, with showers of rain; found the ship at daylight nearly a complete wreck. The glass has been gradually rising all day, and at 9 P. M. stood Barometer 28.80, Sympiesometer 28.60. Midnight blowing hard, with showers of rain.

' The *Persian* lay outside the *Regina*, taking the ground at half tide till 1 P. M. Monday, the 6th June, when after considerable difficulty a Harbour Master and boats were got, and the vessel moored in the stream to her own anchors and cables.'—*Englishman*, June 9.

Range of Barometer on board the Barque DAVID MALCOLM.

TO THE EDITOR OF THE ENGLISHMAN.

DEAR SIR,—In your editorial remarks in your paper of yesterday, I observe you call on Ship Captains for the variations of the Barome-

trical column, as also notes from their Log Books. As I fancy the latter is not of so much importance as the former, our good ships in the river having generally fared *pretty considerably* the worse for it, and our Log Books, I presume, being much about the same, therefore, I have the pleasure to send you one of your requests, as noted under

I am, dear Sir, your's obediently,

R. M.

Englishman, 9th June 1842.]

*Range of the Barometer on board the Barque DAVID MALCOLM,
during the late Gale.*

Thursday noon,	.....	29.35	
„	4 P. M.	.....	29.24
„	9	.....	29.20
Friday,	6 A. M.	.....	29.10
„	8	.....	29.07
„	10	.....	29.00
„	11	.....	28.87
„	11 30	.....	28.77
„	12 or noon	.....	28.70
„	12 30 P. M.	....	28.58
„	1	.....	28.48
„	1 30	.....	28.40
„	2	.....	28.32
„	3	.....	28.30
„	6	.....	28.35
„	7	.....	28.50
„	8	.....	28.70
„	9	.....	28.80
„	10	.....	28.90
„	12	.....	29.5
Saturday, ..	6 A. M.	.....	29.15
„	10	.....	29.20
„	12 noon	.....	29.20
Sunday noon,	.....	.....	29.45

R. M.

Storm of 2nd, 3rd, and 4th June, 1842.—Notes by H. Piddington, published in the Englishman and Hurkaru Newspapers.

During the latter part of May the weather was excessively close and oppressive, particularly during the nights. It was on the 27th that we had the first North-Wester, after which the weather was calm.

Generally, before this the white hazy appearance of the sky was very remarkable, and in countries subject to earthquakes would have been called *earthquake* weather, i. e. shocks would have been expected.

On the 1st June.—At 6 A. M., the Barometer had fallen from 29.625, at which it had previously been (the usual average of May being about 29.72) to 29.465. The wind was E. N. E. in variable puffs, scud rising from heavy nimbi and cumuli to the Eastward, and flying fast from about due East to West. Clear, and rather dark blue sky, with light cirrhi and strata above the scud. Cloudy and squally during the day, and threatening a heavy S. Easter* about noon, which seems to have fallen to the Eastward, for it did not reach us. The scud not remarkable in the afternoon, but always coming from E. and S. E., a thick bank hanging to the Eastward.

2nd June.—After midnight, squally from the East, with rain. Daylight heavy and rapid scud from N. E., wind rising and falling, Bar. at 5-30 A. M. 29.355.

Wind rising and falling very remarkably, at varying intervals of 15, 17 and 5 minutes, with the peculiar moaning noise which accompanies high and variable winds.

At 10 A. M., Wind N. E. by N. strong squalls, and Bar. 29.355. Noon 29.355, strong N. E. gale, rapid white scud, with breaks of dark blue sky and masses of white cumuli.

2 P. M., squalls at intervals, Bar. 29.265, calms and squalls to 7 P. M. when Bar. 29.245, but light puffs and calms till 10 P. M.,† and towards midnight, when Bar. about 29.17, squalls increasing from N. E.

* I use this term to express a heavy burst of wind and rain from that quarter, such as we have from the North-west, and which lasts from half an hour to 3 or 4 hours.

† This is another of the frequent, and indeed almost constant, instances in which these hurricanes appear to moderate for a few hours after their commencement.

3rd June.—By 7 A. M., heavy squalls and rain from N. E. At 5-30 A. M., Barometer 29.065. Thermometer 84°, hard gale with heavy squalls, scud rapidly flying from N. N. E. and N. E. by N.

	Barometer.
At 6-15 A. M., heavy gusts about N. N. E.	29.075
8 .. ditto N. E. by N.	29.035
8-45 .. ditto	29.015
9-15 .. ditto	28.995
10 .. ditto	28.905
10-30 .. ditto	28.865
11 .. ditto Thermometer 83° N. by E... ..	28.735
11-30 .. ditto	28.715
11-45 .. ditto	28.675
Noon .. ditto .. N. N. E... ..	28.625
0-35 P. M.	28.475

Tremendous hurricane gusts at N. E. by N. and N. N. E.

1-5 Longer intervals between the squalls, though yet very heavy,	28.370
1-30 At times almost calm with moderate breezes,	28.345
1-45 Calm,	
2-0 Calm,	28.315
2-30 Ditto scud indistinct, but if driving at all, from E. N. E. to W. S. W.,	28.285
3 P. M. Calm ; scud from East, but very slow and indistinct, a light air from East, with drizzling rain,	28.275

At this time I drove out on the Esplanade. The appearance of the sky was very remarkable. In the zenith the haze was so thick that the direction of the scud could not be determined, but to the East and N. E. it was slowly moving, as before, to the West and S. W. while in the South, from thick heavy masses of clouds, the scud was rising and flying to the North and N. E. !

3-30 A light squall and drizzling rain about S. W.	28.275
4-20 Breeze from S. W. increasing fast, (the scud having begun to move from the South about 3-20,) with squalls and drizzling rain from the S. W.,	28.285
5 P. M. Heavy gusts from S. S. W. to S. W. Scud as rapid from S. W. as before from N. E.,	28.320

5-30 Tremendous gusts S. W.,	..	..	Barometer.	28.385
6 P. M.,	..	..	..	28.525
6-30 Terrific squalls,	..	..	..	28.580
7 „ ditto „	..	..	..	28.650
7-30 Very heavy, but more moderate between the gusts,	..			28.710
8 Heavy gusts again, S. W.,	..	..	..	28.755
8-30 ditto,	..	..	..	28.815
9 Heavy gusts, but more moderate in the intervals,	..			28.850
9-30 Moderating, but with sudden and severe gusts,	..			28.895
10 Sudden gusts,	..	..	..	28.925
10-30 ditto, wind perhaps S. S. W.,	..	.	..	28.985
10-45 ditto, still with severe gusts,	..	..	..	28.995
11-50 ditto,	..	..	..	29.000
<i>4th June.</i> —At 2 A. M., moderating, but still strong gale S.W.,				
At 4 A. M. strong monsoon gale,	..	..	..	29.045
6-10 Strong breezes, but at intervals nearly calm,	..			29.105
10-20 Calm, with breezes at times from the S. W.,	..			29.215

From this time till Sunday, the Barometer was slowly rising to about 29.38, with at times a variable ‘monsoon gale’ from S. W., with intervals of calm, and at others blowing hard in squalls with rain.

From the shift of wind—though in the absence of documents, and on shore, an opinion of the kind is liable to error—I should take this storm to have come up on a track of about S. E. by E. to the N. W. by W.,* in which case, and taking into account the heavy monsoon which was coming up with it, great fears of an inundation about Bursil and Backergunge may be entertained. From the previous state of the weather, I am impressed with the idea, that it may, not improbably, have been also a storm crossing over to us from the China seas, which has occurred before. My Barometer, I should say, is corrected to that of the Surveyor General’s Office.

The following are the Barometrical and other observations from the Surveyor General’s Office at Calcutta, from the 26th May, when the gradual depression below the monthly average to which I have alluded at page 1000 commenced, until the 10th June, when about the same pressure again returned.

* I was three points wrong in this estimate, the track being from S. S. E. to N. N. W. See Summary.

Meteorological Register kept at the Surveyor General's Office, Calcutta, from the 26th May to the 10th June, 1842.

Days of the Month.	Moon's Changes.	MINIMUM TEMPERATURE, OBSERVED AT SUNRISE.						MAXIMUM PRESSURE, OBSERVED AT 9 H. 50 M.					
		Temperature.			Wind.			Temperature.			Wind.		
		Barometer.	Of the Mercury.	Of the Air.	Of an Evaporating Surface.	Direction.	Aspect of the Sky.	Barometer.	Of the Mercury.	Of the Air.	Of an Evaporating Surface.	Direction.	Aspect of the Sky.
May 26		Inches 29.613	85.8	81.0	81.0	S. E.	Clear.	Inches 29.619	89.2	95.9	88.5	S.	Clear,
" 27		.589	87.0	82.2	82.0	Calm,	Clear.	.634	89.6	95.0	88.0	S. E.	Generally Clear.
" 28		.586	86.4	82.1	82.0	Calm,	Cirro Cumuli.	.634	90.2	95.5	88.0	S.	Clear.
" 29		.553	87.8	83.8	82.7	Calm,	Clear.	.598	91.0	96.4	90.2	E.	Cumulo-strati.
" 30		.542	87.0	82.5	82.0	Calm,	Cirro-strati.	.574	90.5	95.5	88.4	E.	Cumulo-strati.
" 31		.510	84.1	82.0	80.9	N. E.	Mists Cumuli.	.522	89.0	92.1	87.0	E.	Scattered Clouds.
June 1		29.398	84.0	81.0	80.9	E.	Nimbi.	29.410	87.0	89.0	85.0	E.	Cloudy.
" 2	☾	.317	82.0	79.7	78.8	N. E.	Nimbi.	.316	85.1	84.5	82.0	N. E.	Nimbi. [Rain.
" 3		.066	79.8	78.2	78.0	N. E.	Blowing gale and Rain.	28.910	80.8	73.0	78.0	N.	Blowing gale and
" 4		.062	79.0	79.9	79.9	S. W.	Blowing a gale.	29.181	80.4	80.2	80.0	S. (high) ..	Nimbi.
" 5		.294	80.5	79.1	77.0	S. W.	Nimbi.	.390	82.4	82.8	89.1	S. W. (high)	Cloudy.
" 6		.394	80.5	78.0	78.8	Calm,	Cloudy.	.418	84.0	84.0	80.4	S. W.	Cloudy.
" 7		.389	82.2	81.0	78.3	S. W.	Cloudy.	.434	85.0	86.1	83.0	S. W. (high)	Cumuli.
" 8		.486	79.0	76.5	76.0	S. W.	Rain.	.529	80.0	79.0	77.0	S.	Overcast.
" 9	●	.536	83.0	81.3	82.0	S.	Cloudy.	.570	84.6	87.5	84.4	S.	Cirro Cumuli and
" 10		.554	81.5	78.9	77.0	S. W.	Cirro-strati.	.615	83.0	83.2	80.0	S. W.	Cloudy.

Meteorological Register kept at the Surveyor General's Office, Calcutta, from the 26th May to the 10th June, 1842.

OBSERVATIONS, MADE AT APPARENT NOON.				MAXIMUM TEMPERATURE, OBSERVED AT 2 H. 40 M.						
Days of the Month.	Moon's Changes.	Temperature.				Wind.		Aspect of the Sky.		
		Barometer.	Of the Air.		Of an Evaporating Surface.	Thermometer exposed to the Sun's rays.	Direction.			
			Of the Mercury.	Of the Air.						
May 26		Inches 29.626	91.4	89.0	93.0	102.0	91.0	128.0	S. W.	Cumuli Haze.
" 27		.618	93.4	93.0	.581	102.0	90.0	127.0	S. E.	Cumuli (partially) &
" 28		.617	92.4	90.1	.554	93.8	90.8	126.0	S. E.	Cumulo-strati.
" 29		.574	94.9	99.0	.529	97.0	90.2	126.5	S. E.	Cumulo-strati.
" 30		.546	92.5	89.8	.526	89.4	85.1	96.0*	S. E.	Cloudy.
" 31		.500	90.0	87.1	.482	85.9	82.2	85.0*	E.	Very Cloudy.
June 1		29.381	88.3	86.9	85.2	80.8	80.2	80.0	S. E.	Drizzly.
" 2	☾	.305	85.1	83.0	.245	84.2	81.0	82.5	E.	Nimbi.
" 3		28.632	81.2	78.5	28.281	81.0	80.0	80.8	N. E.	Overcast.
" 4		29.193	81.9	81.6	29.174	82.7	81.7	83.0	High S. W.	Cloudy. [Drizzly.
" 5		.382	84.0	84.0	.374	83.0	82.5	79.5	S. W.	Blowing a gale and
" 6		.409	84.6	81.4	.409	85.4	85.8	83.1	S. W.	Cloudy.
" 7		.434	86.6	85.0	.422	88.4	89.0	86.0	S. W.	Cloudy.
" 8		.497	82.5	83.0	.493	83.5	83.7	79.7	S. W.	Cloudy.
" 9	☉	.541	88.0	90.0	.514	88.1	90.2	86.5	S.	Cloudy.
" 10		.610	84.3	86.0	.597	86.0	87.0	83.8	W. S. W.	Cloudy.

* On the 3rd, the most severe gale ever felt at Calcutta, every house, all the Ships in the river, received more or less injury, nor was the Mercurial Column ever so low as 28.278 inches.

Meteorological Register kept at the Surveyor General's Office, Calcutta, from the 26th May to the 10th June, 1842.

Days of the Month.		Moon's Changes.	MINIMUM PRESSURE OBSERVED AT 4 P. M.										OBSERVATIONS MADE AT SUNSET.							Rain Gauges.		Moon's Horizontal Parallax at Noon.
			Temperature.			Wind.		Aspect of the Sky.	Barometer.			Temperature.			Wind.		Aspect of the Sky.	Upper.	Lower.			
			Of the Mercury.	Of the Air.	Of an Evaporating Surface.	Direction.	Of the Mercury.		Of the Air.	Of an Evaporating Surface.	Direction.											
Inches	°	'	°	'	°	°	'	°	'	°	'	°	'	°	'	°	'	Inches	°	'		
May 26			29.564	94.9	98.6	88.2	S. W.	Cumuli,	29.564	91.0	91.7	84.5	S.	Generally Clear,				56				
" 27			.534	95.0	99.2	90.6	S.	Cloudy,	.565	91.5	91.5	86.5	S.	Clear,				56				
" 28			.521	94.1	100.6	90.0	E.	Cumuli,	.526	92.5	91.0	88.5	Calm.	Generally Clear,				55				
" 29			.494	93.5	93.9	88.5	S. E.	Cloudy,	.510	90.0	88.8	84.7	S. E.	Cirro-strati,				55				
" 30			.500	90.4	92.0	86.6	S. E.	Cloudy,	.505	89.4	88.5	86.2	E.	Cirro-strati,				54				
" 31			.430	82.9	82.0	81.0	E.	Cloudy, Drizzly,	.431	85.9	81.5	80.5	E.	Cirro-strati,	0.09	0.13		54				
June 1			29.310	85.5	83.2	82.0	Calm.	Drizzly,	29.320	85.0	82.5	82.0	E.	Nimbi,	0.47	0.50		54				
" 2			.234	84.0	81.0	80.4	N. E.	Drizzly,	.234	83.0	81.0	80.0	N. E.	Nimbi,		1.02		55				
" 3			28.278	81.0	79.8	79.9	S. W.	Drizzly,	"	"	"	"	S. W.	Blowing a gale & down.	Over			55				
" 4			29.162	84.0	83.8	81.0	S. W. (high)	Nimbi,	.150	81.7	80.0	79.8	S. W. (high)	Nimbi,		5.17		55				
" 5			.370	82.5	81.5	79.0	S. W.	Cloudy,	.381	82.1	81.0	79.0	W. S. W.	Drizzly,	0.26	0.37		56				
" 6			.402	85.5	86.0	83.0	S. W.	Cloudy,	.406	84.5	84.0	82.5	S. W.	Overcast,	0.66	0.86		56				
" 7			.406	89.7	90.0	87.0	S. W.	Cloudy,	.445	87.0	86.2	84.5	S. W.	Nimbi,				57				
" 8			.490	84.0	84.0	80.0	S. W.	Cloudy,	.502	83.2	82.0	79.0	S.	Cloudy,	0.38	0.47		58				
" 9			.514	89.0	90.4	86.8	S. W.	Cirro Cumuli	.520	86.5	86.0	84.0	S.	Cloudy,				59				
" 10			.585	86.0	86.4	82.8	W. S. W.	Cloudy and Haze,	.597	84.5	83.0	81.7	Calm.	Cloudy,				59				

Meteorological Register kept at the Surveyor General's Office, Calcutta, from the 26th May to the 10th June, 1842.

Days of the Month.	OBSERVATIONS MADE AT 8 P. M.				OBSERVATIONS MADE AT 10 P. M.				OBSERVATIONS MADE AT 12 P. M.			
	Temperature.			Barometer.	Temperature.			Barometer.	Temperature.			Barometer.
	Of the Mercury.	Of the Air.	Of an Evaporating Surface.		Of the Mercury.	Of the Air.	Of an Evaporating Surface.		Of the Mercury.	Of the Air.	Of an Evaporating Surface.	
May 26	.75	90.0	87.0	.75	90.0	90.0	87.0	.75	90.0	90.0	87.0	.75
" 27	.74	90.0	87.0	.75	90.0	90.0	87.0	.75	90.0	90.0	87.0	.75
" 28	.75	91.0	85.0	.75	90.0	87.0	88.0	.75	90.0	87.0	88.0	.75
" 29	.75	90.5	90.0	.70	90.25	90.0	88.0	.70	90.0	90.0	88.0	.70
" 30	.75	90.5	88.0	.70	90.5	90.0	88.0	.70	90.0	90.0	88.0	.70
" 31	.65	85.0	84.0	.65	85.0	85.5	84.0	.65	85.0	85.5	84.0	.65
June 1	29.500	86.0	84.0	29.500	85.0	85.0	83.5	29.500	81.4	81.0	80.5	29.100
" 2	.700	83.0	82.0	.700	83.0	83.0	82.0	.700	81.4	81.0	80.5	.500
" 3	28.900	81.0	80.5	28.950	81.0	81.25	80.5	28.950	82.5	82.0	80.0	.560
" 4	29.450	82.0	80.0	29.450	82.0	81.4	80.0	29.450	84.5	84.0	83.0	.650
" 5	.550	84.5	83.0	.550	84.5	84.0	83.0	.550	85.0	85.0	83.5	.750
" 6	.575	84.0	83.0	.600	84.0	84.0	83.0	.600	84.0	84.0	83.0	.750
" 7	.700	85.0	83.0	.700	85.0	84.5	83.0	.700	85.0	84.0	83.0	.750
" 8	.700	85.0	83.5	.700	85.0	84.0	83.5	.700	85.0	84.0	83.5	.750
" 9	.700	87.0	87.5	.750	86.5	86.0	86.0	.750	85.0	83.5	83.5	.750
" 10	.750	86.0	84.4	.750	86.0	85.4	81.0	.750	84.0	83.5	81.0	.750

N. B.—From a comparison of the two Barometers, the Mercury in that at the Dispensary stands 1.10th of an inch higher than that in use at the Surveyor General's Office.

SECTION V.

*From Calcutta Inland.**Letter from R. J. Homfray, Esq. Midnapoor, Lat. 22° 25' N.**Lon. 87° 25' E.*

“ I had no barometer, so am unable to enlighten you on that point. I have delayed answering your letter, that I might inform you of the results to the westward of this station, as from the published accounts of its effects in Calcutta, I was disposed to consider its force less here, and probably more so, as it extended westerly, and which I find to be the case, as on the Subbunreeka river, which separates Bengal from Orissa, and lies in some directions fifty miles, and in other twenty-five miles from hence, its effects were not felt, and only existed in refreshing rain. At daylight on Friday the 3rd instant, heavy squalls following in rapid succession; wind from the N. E., rain plentiful and without interruption, but apparently not falling heavily. Mid-day same, thermometer 78°, strong wind in hard puffs and plenty of scud, wind from N. E., *lulled after mid-day till between two and three o'clock*, when it came on again from the W., blowing stronger and stronger, with heavy gusts at short intervals all night, with heavy and uninterrupted rain; during the night I found the wind at N. W. Saturday morning, daylight, moderated, rain by gage since yesterday morning $6\frac{3}{4}$ inches, gradually moderated all day, wind at S. W. thermometer mid-day 78°, occasionally no rain, the wind blowing strong till evening when it became nearly quiet, and put on the usual appearance of monsoon weather. Sunday morning 5th, rain since yesterday morning $1\frac{1}{4}$ inches. No trees of any consequence fell, but 200 houses and upwards in the native part of the town came down, and the verandah or portico of two gentlemen's houses fell, one having a North, and the other a Western aspect. No thunder or lightning.

R. J. HOMFRAY.

Chandernagore.

Observations on the storm of 2nd and 3rd June 1842, made at Chandernagore, by J. St. Pourçain, Esq. Barometer corrected to that of the Surveyor's General's Office by a subsequent comparison.*

* There is no difference in the level of the two places worth noticing.

1st June.—Hot weather with fresh breeze from the N. E., squalls and rain at times from the Eastward. Every thing announcing a change of weather and the setting in of the rains. Barometer from 29.594 to 29.494, thermometer 84° to 82°.

2nd June.—Bad weather in squalls with rain at times, and blowing fresh from N. West to East, Barometer 29.394, very cloudy, the wind at times falling almost to a calm. At 11 A. M. worse weather, Barometer 29.294. Rain at times, thermometer 80°.

3rd June.—Worse weather, heavy squalls from the N. E., and at 6 in the morning Barometer 29.194 and falling, Thermometer 80° blowing hard with heavy squalls from N. E. to N. N. E., every thing announcing a storm, heavy clouds flying from N. to South.

Barometer.

At 8, very heavy squalls from N. E.	29.094
9, .. ditto ,,	28.994
10, .. ditto ,,	28.894
Noon .. ditto ,,	28.794
1 P. M. .. ditto ,,	28.694
2 ,, .. ditto ,,	28.644
3 $\frac{1}{4}$,, .. ditto ,,	28.494
4 $\frac{1}{4}$,, .. ditto ,,	28.394
5 $\frac{1}{4}$,, ... ditto ,,	28.344
6 $\frac{1}{4}$,, .. ditto ,,	28.344

Between $\frac{1}{4}$ past 5 and $\frac{1}{4}$ past 6 was the heaviest of the hurricane. It was then blowing tremendously heavy in squalls from the N. E. At 7-15, the barometer began to rise, being at 28.396, the wind terrible and in gusts with longer intervals, but its violence undiminished. At 8-15, the same gusts, as strong but less frequent from N. E. to N. N. E., barometer 28.494, thermometer 78°.

Barometer.

9-15, the same,	28.594
11-15, ditto	28.894

4th June.—2 A. M. weather more moderate, winds variable, and light from N. N. E. to S. W., with drizzling rain, cloudy and heavy scud driving up from the Southward to the North. At 4 A. M. blowing strong in short but heavy squalls from the S. W. Thermometer 78°. At 6, blowing very hard with terrible squalls from the S. W.

Barometer.

At 8, the same,	.. .. .	28.994
At 10, moderating, but at times squalls from the N. W.		
with drizzling rain,	.. .. .	29.194
At noon moderating, but at times squalls from the S. W.		29.194
At 2, clearing up, but slight squalls still ; barometer rising gradually from 29.294 to 29.394, thermometer 80°.		

This is the heaviest hurricane that I have seen in this country after a residence of 22 years ; great damage done in the town to houses and trees.

In reply to some inquiries Mr. St. Pourçain says, " I assure you that we had never the wind from S. E. or S. S. E."

We have two reports from Chinsurah, the first from Mr. Sutherland, Principal of Hoogly College, the second from Mr. Herklots, Principal Sudder Ameen. Mr. Sutherland's letter is as follows :—

The wind appeared as nearly as I could judge to come from N. N. E. on the commencement of the gale, which was about Friday noon. We had rainy threatening weather on Thursday afternoon, and the wind had been to the Northward a day or two before. The wind seemed to me to veer several points ere it flew round to the S. E. and E. S. E. on Saturday night, and there were frequent lulls. There was a lull on Saturday morning and another on Saturday evening, the rain was almost continuous, but most copious on Sunday night when the gale had taken off. We had, early on Sunday night, some thunder and lightning. The upper verandahs of the College to the North and East and South-east are blown completely in, the screens between the windows are torn right out of the pillars, and several windows and doors blown not merely in, but right out of the walls, sills and all.

The following are Mr. Herklot's Registered Observations on the Weather at Chinsurah, from the 30th May to the 9th June, 1842.

From Thursday the 26th to Sunday the 29th May, the thermometer in the shade at 3 P. M. was on each day, 100°

May 30th, cloudy,	..	..	..	..	..	no observation.
„ 31st, ditto, wind East,	..	..	..	..	..	90°
June 1st, in the afternoon a shower, wind East,	..	..	..	..	..	86°
„ 2nd, a little rain, strong East wind,	..	..	..	..	..	no observation.
„ 3rd, a tremendous gale from N. E. ; beginning at 9 A. M., shifting to the North, in the afternoon returned to East, at 5 P. M. most furious,	..	..	..	..	..	78°
„ 4th, the gale abated ; soft rain day and night,	..	..	..	..	..	80°
„ 5th, rain and wind all day from S. E.,	..	..	..	..	..	80°
„ 6th, cloudy with little rain, wind S. W.,	..	..	..	..	..	85°
„ 7th, ditto ditto W. and S.,	..	..	..	..	..	88°
„ 8th, ditto ditto S. . .	..	..	..	..	..	90°
„ 9th, clear, with sunshine, wind S.	..	..	..	..	..	94°

NOTE.—Rain very moderate, there was no lightning and thunder during the gale. On the 3rd June there was scarcely any rise of the river at flood tide. On the 5th, the river began to rise uncommonly, said to have been occasioned by an extraordinary rise of the Adjye river at Cutwa.

Subsequent to the spring tides of the new moon on the 9th instant, the river has fallen a good deal.

P. HERKLOTS.

It will be remarked here, that while at Chandernagore the gale veered to S. W. after an interval of calm, it veered by the East at Chinsurah. The two stations are four miles apart only, and lie nearly North and South of each other, Chinsurah being to the Northward ; I shall further allude to this in tracing the course of the storm.

The following letter is from *about* latitude 24° 48' N. longitude 88° 50' E. I was not able to learn the writer's name, but I am assured that this is not far from the true position of the factory.

Effects of the Gale.

TO THE EDITOR OF THE ENGLISHMAN.

The gale commenced here on the morning of the 3d, with strong Easterly winds increasing to a perfect hurricane. On the 4th, wind veered a little to the Northward with occasional tremendous squalls ; towards evening temporary lulls, but rain pouring in torrents. On the 5th, wind veering about from E. to S. E. and South, blowing tremendously with torrents of rain. The 6th, still blowing tremen-

dously from S. S. W., and nearly due West ; towards evening the gale subsided.

The effects are most dreadful, some of the concerns hereabout losing all hope of one-half of what they expected, others one-third, &c. To add to our disasters, the river took a most unexpected and sudden rise of some $4\frac{1}{2}$ to 5 feet in as many days.

Banks of the Jumna, June 18, 1842.

P. S.—I hear that the gale was much less severe, higher up the river, and towards Mymensing scarcely felt.

From Kissennuggur I have obtained, by the attention of Dr. Fuller, Civil Surgeon, a report from its immediate neighbourhood, and another was published in the Newspaper, which I give after that of Dr. Fuller's friend.

The enclosed is the only tolerable account I can obtain for you, of the late Storm.

2nd June.—At Kissennuggur, we had light rain, and the weather very cloudy ; towards evening the wind rose and continued the whole of Friday (3rd) from the N. E. with wind and drizzling rain day and night.

4th June.—Wind round to the Southward, and the storm less furious, drizzling continuing. No Calcutta dâk in.

5th June.—Weather still very unfavorable, rain and wind all day, and no Calcutta dâk in ; on the morning of the 6th, the wind had ceased, but there was rain and very dark clouds, towards evening it became fine. There is not a barometer at the station, consequently I fear, that these rough notes will be of little use to you.

C. W. FULLER.

This Report is from a Factory, a short distance from Kissennuggur.

I did not observe the *times*, when the wind varied as it appeared to do every ten or fifteen minutes. The storm commenced on the night of the 4th June, about ten or eleven o'clock, apparently from N. N. W., in the course of the morning ; it was S. W. by three or

four p. m. of the 5th, which was the worst time of the gale with us, it blew from S. S. W. for two or three hours, slightly veering to S. E. About midnight of the 5th, the wind came round to the point it began from, blew furiously for about an hour, and gradually subsided into a calm.

Hurrah, 4th July.

R. DE COURCY.

Kissennuggur.

The gale commenced here on the evening of the 2nd instant from due East, and continued from that point all the 3rd; on the 4th, when it blew heaviest, it veered round to South, occasionally varying to S. S. W., when at its *height* the wind blew from direct South. On the 5th, it went round to S. East; and finished its fury on the 6th from due East.

As I have already said, 9 inches of rain fell during the continuance of the gale, but I am persuaded, that much more must have fallen, for the force of the wind blew the rain in quite a horizontal direction, consequently, much more rain must have fallen than the rain gauges indicated.—*Englishman, 18th June, 1842.*

The Storm at Plassey, Lat. 23° 47' N. Long. 88° 19' E.

We have been on the look out for letters from the Lower Provinces, giving some account of the effects of the hurricane, but up to this time nothing has been received. A letter of the 3d June, 5½ p. m., from near Plassey on the Bhaugretty, says:—

‘It has been blowing a *tremendous gale* to-day from N. E., it is now increasing. My Barometer is *nearly* down to 29 and falling—4th June, 6 p. m. The gale continues, the wind has been from S. E. to-day. I could not get a boat to cross yesterday, my dawk man may be more fortunate this evening.’—*Englishman, 18th June, 1842.*

To Mr. Russell, B. C. S. I am indebted for the following account of the Storm at Berhampoor, Latitude 24° 9' N. Longitude 88° 12' E.

On the 1st, we had fine but warm weather, the Thermometer in the centre room of my house open to the N. and S. standing at day-break at 83°, and at 3 p. m. 95°, a few days before it had been at 98°.

On the 2nd at $\frac{1}{2}$ past 3 P. M., a storm with much rain from N. W. unattended with thunder and lightning, the morning had been fine, and so was the evening and early part of the night; towards the morning of the 3rd, it became cloudy; at day-break light wind from N. E. and a little rain. At 7 A. M. wind increased and continued to blow with great violence the whole day. About 10 P. M. the wind increased, and blew with fearful violence until the morning of the 4th, when it fell a little, but it still blew with great violence the whole day, with heavy gusts and much rain, and continued so until 8 A. M. on the 5th, when the wind veered round to S. W. or rather nearer W. and blew from that quarter with great violence until next morning, the 6th, when it died away; but the rain did not cease until the afternoon, since then the sky has been clear until this time, with Southerly wind.

C. D. RUSSELL.

In reply to some inquiries, Mr. Russell writes as follows :—

The storm commenced on the morning of the 3d with the wind from N. E., but from 7 A. M. on that day until 8 A. M. on the 5th (Sunday,) it blew steadily from the East, or a little North of East, it then went round to S. W., and remained in that quarter until it cleared up. The storm was most violent during the night of the 3d.

C. D. RUSSELL.

From Jungypore, Latitude 24° 28', Longitude 88° 08', we have the following report to Government by Mr. Deputy Collector Smart.

2d June.—4 P. M. a smart shower of rain, with slight gale from N. N. E.

3d June.—Raining slightly off and on all day, blowing in slight puffs from N. N. E. 9 P. M. blowing in tremendous gusts from the same quarter and continued the whole night, with little rain.

4th June.—Blowing from the same quarter, and pouring in torrents till 7 P. M., when veered to the East, blowing furiously all night, with plenty of rain.

5th June.—6 A. M. wind veered to S. E.; 1 P. M. blowing from S. S. E.

6th June.—Wind veered to S. S. W., gale abating, noon blowing in subdued gusts from W.

The gale could not have been so severe here, as it appears to have been in Calcutta; *not a tree or hut blown down*. The most remarkable feature was, the quantity of rain that fell. Lands which are inundated so late as August, are completely flooded. The river is rising rapidly.

E. SMART, *Deputy Collector*.

Mr. Lautour, Magistrate of Dinagepore, Latitude 25° 07' N. Longitude 89° 40' E. has kindly sent me the following report of the weather as experienced at that station.

2d June.—Heavy shower from the S. E. and E. S. E. at 5 P. M.

3d June.—Cloudy throughout, and towards evening every appearance of a gale, which commenced about 10 o'clock, and continued increasing throughout the night, with small rain, wind N. E.

4th June.—Gale and rain continue without abatement, wind N. E. and E. N. E., no abatement during the night.

5th June.—The gale moderating, the wind gradually drawing round to the Southward of E., gradually declining in violence throughout the day, and the whole country under water on Monday morning. I have no means of giving you any Barometer returns; the quantity of rain which fell during the gale was from four to five inches. It extended some distance North of this, as a friend of mine was put down in his palkee between this and Titalyah; the gale was not felt at Darjeeling, where the weather however was wet. During the gale, the wind never veered to the West. I suspect you will find Titalyah to have been its northern terminus.

E. LAUTOUR, *Magistrate*.

I did not neglect Mr. Latour's remark, and in reply to my application, Mr. Montgomery, the Post Master, has been good enough to send me the following account of the weather experienced there. Titalyah is in latitude 26° 28' N. longitude 88° 25', or about on the meridian of Calcutta.

In reply to your letter of the 15th instant, I beg leave to state, that the weather here from the 1st till about one o'clock A. M. 4th, was

gloomy, with much rain, accompanied with squalls from the N. W. and a great deal of thunder and lightning. About 1 P. M. on the morning of the 4th, it blew almost a hurricane from the S. E., with heavy rain, thunder, and lightning ; this continued for about two hours, when it fell calm, but the rain still continuing to fall heavily till the morning of the 5th.

I had no means of noting the temperature of the air during this time, not having any instruments.

P. MONTGOMERY, *Offg. Post Master.*

Mr. Martin, Magistrate of Purneah, latitude 25° 45' N. longitude 87° 23' E. has kindly sent me the following account of the weather as experienced there.

The gale which caused so much disaster in Calcutta, set in here about 7 A. M. on Saturday the 4th June, with strong squalls from the North East, accompanied with driving sleet ; over-head the scud was flying very fast, and without intermission. On the earth the wind frequently moderated for short intervals during the day of the 4th, but towards nightfall set in with increased violence from the same point of the compass, blowing hard all night. For several days previous, the weather had been murky and oppressive, but we had no Barometer to consult, and were not aware that a storm was impending. On the morning of the 5th, the gale continued with unabated rigor, and blowing from the same point, or N. E. so far as I can remember, but towards evening it veered a point or two to the Eastward, still blowing with the same violence. Thus it continued till 5 or 6 P. M. of the evening of the 6th, when the storm appeared to be breaking, and the clouds to rise all round. On the morning of the 7th, the wind had quite abated, though the clouds were still heavy, and boded much rain. Suddenly about 7 A. M., a strong North-wester sprung up with extraordinary violence, and it blew as hard as ever for about an hour and half, accompanied by a deluge of rain. I don't remember that the wind ever came from the South-east, as stated in the Calcutta newspapers.

E. MARTIN, *Magistrate.*

Purneah, July 1842.

Soorajgunge, latitude 24° 26' N. longitude 89° 42' E. Memorandum from his register by J. Martin, Esq.

2d June.—Appearances of bad weather, squally, large and heavy clouds surrounding the horizon.

3d June.—At 2 A. M., gale commenced blowing from the Eastward, followed almost immediately by a torrent of rain, the wind increasing every hour.

4th June.—The wind shifting from E. to E. S. E., and blowing with the same violence as the day previous.

5th June.—At 8 A. M., the wind suddenly shifted from E. S. E. to S. W. after a momentary calm, blowing almost a hurricane the whole day and night.

6th June.—Weather the same at noon, the winds abated a little, and at 5 P. M. shifted from S. W. to W., the storm having subsided into a light Westerly breeze.

From Kunjirpore Factory, Bhaugulpore Zillah, a few miles E. by N. or E. N. E. of the station, lat. about 25° 12' N. long. 87° 09' E., I have received from Mr. A. Pinard, the following Memorandum on the gale of the 3rd to 6th June 1842:—

3d June.—At 6 A. M. wind South, weather threatening from that quarter, dreadful heat, large drops of rain falling scantily. At 4 P. M. wind from the North, and from the same quarter all night.

4th June.—Wind has veered to N. E., blowing fresh with drizzling rain, Ther. 82°. At 10, wind came to E. N. E., heavy rain and blowing strong till noon, when the wind came back to N. E., and the rain ceased, Ther. 81°. At 2 P. M. wind E. N. E., heavy rain and wind, Ther. 82°. At midnight the gale was at its height; wind E. N. E., the rain reduced to mist by the force of the wind.

5th June.—At 5 or 6 A. M., the same wind and weather, Ther. 79°. At 10, wind from the North, heavy wind and rain, Ther. 78°. At noon wind N. W., heavy rain, wind not so strong, Ther. 79°. At 4 P. M., wind W. N. W., heavy rain at 6 P. M., wind veered to West, still blowing strong, and heavy rain.

6th June.—Wind West, drizzling rain, dark cloudy weather, wind almost calm or very light at times. At 6 P. M., the weather was fine.

The river began to rise from the 4th by the heavy rains on the mountains to the South of Bhaugulpore, and great mischief was done. I regret much that I had no Barometer.

A. PINARD.

Bancoorah, latitude 23° 14' N. longitude 87° 10' E.

Dr. Cheek, Civil Surgeon, gives me the following valuable accounts of the storm, the first being his own, and the second procured from Mungulpore, a station about fifteen miles to the N. by E. of Bancoorah.

MY DEAR SIR.—Yours of the 22d, duly reached me on Saturday last, and you would have heard from me before on the subject of the late terrific gale, could I have given a report worth your having. I feel deeply interested, I am sure, in the inquiry you have in hand, it is a subject of importance to all. I had lent my Barometer to my friend Hannington at Purulea ; he I am pretty sure has sent his report.

On the 2nd, we had rather high wind nearly all day from the Eastward, with occasional heavy showers. At about 4 P. M. the wind came round to the North with great violence and with heavy showers, blowing nearly from the same quarter all night. On the 3rd, it was W. N. W., with heavy gusts and continued rain. About 5 P. M. it came to the S. W., and from that quarter continued till the 4th, blowing tremendously, with thick small rain. 5th, wind in the same quarter, with heavy rain till the afternoon, when it was less severe, the wind coming round to the South. On the 6th, wind South, with heavy rain. 7th we had fine weather which continued to the 14th. Night of 14th, a severe North-wester. From that time to this we have scarcely seen the sun ; we have had gusts of wind with heavy showers till to-day. I have never seen such weather at this time. I do very much regret my report is not more scientific, the reason I have stated, not having had my Barometer.

G. N. CHEEK.

Bancoorah, July 16, 1842.

MY DEAR SIR,—As I promised, I wrote to Mr. Erskine; who during the late gale was near the Raneegunge coal mines on the Damooda, in reply he states as follows :—

I got your note with Piddington's, which I forwarded to my brother. I don't believe he has kept a memorandum of the weather. I generally do, but am not particular about the hour. Here is a copy of what I have, if it be of any use. At Munglepore $23^{\circ} 33' \text{ N. } 87^{\circ} 13' \text{ E.}$ from the 26th May, we had strong Easterly winds, which continued very regular to the 30th, when it began to be cloudy; the moon was very "watery looking," with a circle round her. On the 31st, the wind was more Northerly, and cloudy.

1st June.—Easterly wind, heavy white scuds, with a dark blue sky.

2d June.—Strong N. E. winds, in puffs, with occasional showers, in the day clear, evening light winds.

3d June.—Strong N. E. wind and scud with rain, with slight intermissions, and getting stronger and more Northerly; gale, and rain all night.

4th June.—Strong Northerly gales and incessant rain, wind veering to the Westward, but no intermission of rain, all night Westerly gales.

5th June.—Wind South-westerly, more moderate, and rain abating; at noon Westerly gale again and very heavy showers; evening S. W. wind, rain more moderate, clearing up at midnight after a heavy thunder storm with rain.

6th June.—Southerly winds, heavy clouds but no rain, fair all day, wind changeable from S. W. to S. E.

7th June.—Southerly airs, clear and sunny, and we had little rain till it began again on the 15th to fall regularly."

G. N. CHEEK.

Monghyr—Newspaper Report.

A GALE.—We have had an opportunity of perusing a letter dated the 9th instant, from Monghyr, which mentions, that on the 31st ultimo, the station was visited with strong breezes from the S. E., which gradually wore round to the N. E., and at times to the N. N. E.

increasing in force until the 4th instant, when it subsided. From the extent of injury done, it would appear that the strength of the storm there was not at all equal to that felt in Calcutta; as the letter in question observes, that with the exception of a few native boats having been driven on shore, and some of the branches broken off the trees in the fort, no other damage worthy of record had been sustained. Many boats had, however, been lost between that station and Bhaugulpoor. It was also stated, that Monghyr and the surrounding districts had experienced several slight shocks of earthquakes during the month of May, but none of them would seem to have been unusually severe — *Hurkaru*.

Messrs. Willis and Earle, from letters of their Correspondents, have obliged me with the following.

Mr. Bluett, who manages a factory for us about forty miles from Monghyr, nine miles from Surrajgurrah on the Ganges, at Lucky Serai, reports a severe earthquake there on the 23d May, and subsequently very hot and oppressive weather with Easterly winds; and then in date of June 6th, says, “We have at last had rain, and enough of it too. It set in on Friday, 3rd June, and all Saturday and Sunday it rained hard, and blew almost constantly *from the Northward*, it cleared up about midnight on the 5th instant.” The river, Kewl (or Queule, a mountain stream from the Curruckpore hills,) rose suddenly two feet higher than last year, running a foot over Lucky Serai village, or higher than has been known many years.

Mr. E. Morgan from Monghyr, in date of the 8th June, writes, “A few days ago, there was a short but strong dry storm, which sunk about twenty boats near this. I think the rains may be said to have set in on the 3rd instant; from that to the night of the 5th instant, there was heavy rain and a strong gale, so that I think more boats must be lost. On the 6th, 7th, and to-day, there has been rain.”

From Mr. Palmer of Monghyr, latitude 25° 23' N. longitude 86° 38' E. I have received the following interesting detail of the weather at that station about the time of the storm.

The whole of this season, I mean from January, has been rather a remarkable one, and very different from that which I have observed

at this station for the last seven years. The annual passing showers of January and February did not visit us. March and April, though generally one stream of strong N. W. and N. E. winds, approached us with somewhat less fury, and with a secession of a day or two intervening between the gusts. May was sultry in the day without the usual hot-winds, but attended with a cooler feeling by midnight, until near the 19th, when the air became heavy and oppressive to a degree, and the sky had a peculiar hue about the time of the setting of the sun; this continued until the morning of the 21st, and though we look forward to some kind of coolness, or a light air about dawn, it was the reverse this morning, a lethargic sensation seemed to hang about one until quarter after nine, when the earth was observed to tremble and rock from E. to W. for half a minute, vibrating those wall shades only in *that line*; when, as if a second shock, though I could perceive no stop, came from the direction of N. and S. affecting the wall shades again in that line; the last undulation appeared the strongest, this was repeated three times each with less force. On the 23rd, two more slight shocks were felt, since which period up to the night of the second of June, the sky assumed every evening an ashy colour, blended with tints of a salmony hue, and very oppressively hot. A strange effect it appeared to have on all trees in either blossom or young fruit. As a proof of this, the whole of the fruit in my garden was stunted in its size, with a kind of harsh flavor, though free from any worm; the blossoms falling off in a manner as if each leaf was partially baked to make it crisp. The star-apple flowered three times, and fruited twice in May and June, and several kinds of plants seemed to shrink and stay their growth. As I am no Botanist, and but a bad Agriculturist or Horticulturist, I cannot, I regret to say, give you a better relation.

The night of the 2nd June and the whole of that day, there was not sufficient air to move a single leaf; it was so oppressive, that I observed the very air produced from the punkah, when pulled, descended hot, and this oppression continued apparently in an increased ratio until about two o'clock in the morning of the 3rd, when the first burst of wind came on from the N. W.; so sudden and so rapid was its progress, that nothing I could write, could explain the rapidity of the change, when it chopped round to N. E. in awful gusts, such as I

have never before witnessed, accompanied with a deluge of rain ; this continued without intermission for three days, (3rd, 4th and 5th,) rain pouring in torrents, and the wind with awful force playing from the W. to N. E. and S. E. The first gust of the W. wind, no doubt with the assistance of the rain, had a tendency to raise the waters of the Ganges, which it did to near five feet the first night. There appeared but little thunder or lightning during the whole time.

I have but one remark more to make. I have observed these awful visitations, commonly known by the name of the May gale, visit us with the greatest severity every *ninth* year. Its annual visitation is severe enough; but those which follow in *ninths*, are accompanied with greater disasters to the shipping and the country than the annual ones. On this subject, and its peculiarities, I have drawn up a paper, which I believe will be made public.*

PETER PALMER.

Sooree in Beerbhoom. Latitude 23° 54' N. longitude 87° 32' E.

Mr. Saunders, in a report to Mr. Masters of La Martiniere College, which he obligingly desired might be communicated to me, gives the following account of the weather :—

1st June.—Was a bright sun-shiny day.

2d June.—Drizzling rain in the morning up to 2 or 3 P. M., wind I believe Easterly, heavy showers during the night.

3d June.—Overcast in the morning, with drizzling rain at intervals. At about 5 P. M. it began to rain sharp, and soon after dark very heavily, with high wind from the N. E., incessant rain all night, and all day of the—

4th June.—With strong wind in the same direction up to 9 P. M., when I went to bed ; during the night the wind shifted round to the West. It was in that direction about 2 or 3 in the morning of the—

5th June.—Rain continuing throughout incessant and very heavy. At about 2 P. M., the wind shifted more to the North, say N. W. At 5 P. M., the wind and rain moderated, but it continued all night, and morning of the—

* Mr. Palmer will confer a great obligation on meteorologists by this publication.
—H. P.

6th June,--It was calm. I have no Barometer, the gale was strongest on the morning of the 5th, after the wind had shifted to the Westward, say between 4 and 7 A. M. Observed no calm, rain and wind incessant from the evening of the 3d to the evening of the 5th; one tree in my court-yard blown down. A tall palm, about three feet in circumference, was blown down during the night of the 4th, or rather morning of the 5th, most probably before 7 A. M. of the 5th, lying E. by N. and roots W. by S. Heavy rain. All the country overflowed, mud walls washed down; but no roofs blown off, and no thunder and lightning.

Between 1 and 4 P. M. of the 3d, it was gloomy drizzling weather, with not much wind; what there was came from N. E.

Purulia, latitude 23° 20' N. longitude 86° 24' E.

From Captain Hannington, 1st Assistant to the Governor General's Agent, S. W. Frontier, Maunboom, I have received a valuable report, and he has subsequently ascertained the difference of level between his station, Purulia, and Calcutta, so as to enable me to apply the barometrical correction, reducing the observations to the same level as those taken at Calcutta. Purulia being $672\frac{1}{2}$ feet above the level of Calcutta, the correction becomes 0.676. additive, to his observations, to reduce them to the standard of ours, which has been done in printing his table, by adding a second column to them, headed "Corrected to the level of Calcutta."

Meteorological Register, Purulia. Latitude 23° 20' N. Longitude 86° 24' E. Barometer by Bate of London. Thermometer by Levy, Bristol, boiling point 213°.

Date.	Hour.	Bar.	Bar. corrected to the Level of Calcutta + .676	Ther.	Direction and force of Wind.	Remarks.
1842						
June 3rd	8 A. M.	29.05	29.726	78	N. E.	The gale commenced at N. E. on the morning of the 3rd at about 4 A. M., and continued with gusts and heavy showers throughout the day. The wind drew very gradually round to the N. W., in which quarter it remained steady, and at its greatest force for about thirty hours. Then drawing by degrees more and more Westerly, the gale abated, and terminated at W. S. W.
"	Noon	.04	.716	82	"	
"	4 P. M.	.03	.706	79	N. W.	
"	6 P. M.	.02	.696	79	N. N. W.	
"	7 P. M.	.01	.686	80	N. W.	During the 6th June, the wind drew to the South, and has since alternated between South and West.
"	6 A. M.	29.00	.676	79	"	
"	8 A. M.	.00	.676	79	"	
"	Noon.	28.96	.636	79	"	
"	4 P. M.	.96	.636	79	"	It is observable, that the Barometer continued falling after the storm ceased, and has since risen very slowly, being now, (noon, June 10th,) only 28.95. The average height of the Barometer at this station is 29.50.
"	8 P. M.	.96	.636	79	W. N. W.	
"	8 A. M.	.95	.626	78	"	
"	10½ A. M.	.945	.621	79	W.	
"	Noon	.945	.621	77	W. S. W.	Should this memorandum present any discrepancies, they may perhaps be ascribed to the neighbourhood of an extensive range of hills, having an elevation of 1,000 to 1,200 feet, distance about 8 miles, and bearing from S. W. to West.
"	2½ P. M.	.94	.616	78	"	
"	4 P. M.	.94	.616	79	"	
"	8 P. M.	.94	.616	79	"	
"	6th				S. W.	N. B.—The above terms are according to the memorandum, dated Admiralty, Dec. 28, 1838.
"	5 A. M.	.92	.596	77	"	
"	Noon	.92	.596	79	"	
"	8 P. M.	.92	.596	82	S.	

J. HANNYNGTON,
Principal Assistant.

MAUNBHOOM DIVISION,
Principal Assistant's Office, Purulia, 9th June, 1842.

In reply to some inquiries, of which the purport will be seen by the answers, Captain Hannyngton says, "In making observations on the late storm, I was anxious to note any sudden shifts of wind, and unless they occurred during the nights, (which I have no reason to think probable,) I feel tolerably certain that none such took place. The changes were so gradual, that I could not fix the times to any satisfactory degree of accuracy.

"The weather here became unsettled and gloomy on the 1st June, and on the 2d, we had a fresh breeze from the East, with nearly constant rain. It would seem, that the storm travelled from Calcutta to this place, and lost much of its force in the transit. We had a strong gale, but nothing more; no trees or houses were blown down."

The following reports embracing, as they do, a large zone from Tipperah to Assam, and thence to the West, through Oude, to Almora, Kurnaul, and Bombay; and in the South at Sumbulpore, &c., will be read with interest, as comprising good accounts of the effects of these storms, beyond their strict limits.

It is not intended to assume here, that all the phænomena recorded, were the effect of the storm, but that some of them may be well *supposed* to be so, and the whole are worthy of being noted, as giving some idea of what occurs inland, over a large tract of country, on these occasions. The indications of the Barometer at Bombay, and at Deesa, are evidently proofs, that the atmosphere was affected even at this great distance.

*From Comillah, Lat. 23° 28' N. Long. 91° 2' E. by Dr. Foaker,
Civil Surgeon.*

Deeming it of consequence that you should be informed how far the storm that lately raged at Calcutta, extended in this direction, I have the pleasure of informing you, that from the best information I can collect, Dacca appears to be the nearest place at which it was felt, for it did not extend to Doudkandy, a thanah at the mouth of the river Goomty, 32 miles from this in a Westerly direction, nor was it felt

for many miles to the South of this district, nor, as I am informed, at Chittagong.

On the night of the 3d of June, we had a severe squall attended with heavy rain from the N. W., veering round to the South; but this was nothing out of the common course, as we had been visited with similar ones for weeks before; in fact, we have had a succession of stormy and rainy weather since 25th of February, from which time until this date, (the 23d,) 3 feet 4 inches 2-8ths of rain have fallen, and during the entire year 7 feet 11 inches 5-8ths. I am not able to give any information regarding the Barometer, as there is not one in the station. The Thermometer here on the 1st, 2d, and 3d, varied from 87° to 88°.

T. FOAKER,

Comillah, June 23, 1842.

Assistant Surgeon.

In the vicinity of Sebsagor, Upper Assam, from R. H. Buckland, Esq. Superintendent, Assam Company.

Meteorological Observations taken at Nazera, in June 1842.

Date.	Sunrise.			2. P. M.			Sunset.			Remarks.
	Barometer.	Thermometer.	Weather.	Barometer.	Thermometer.	Weather.	Barometer.	Thermometer.	Weather.	
1	29.13	75	S. E. Rain.	29.12	83	E. Cloudy.	29.13	83	S. Cloudy.	
2	" 12	76	S.E. Cloudy.	" 13	84	S. Do.	" 12	84	S. E. Do.	
3	" 11	75	S. Fair.	" 11	85	S. Do.	" 05	86	S. E. Do.	Distant Rain.
4	" 08	78	S. Rain.	" 07	83	S. E. Do.	" 05	84	E. Do.	
5	" 10	78	E. Do.	" 05	86	N. E. Do.	" 08	82	E. Rain.	
6	" 06	78	E. Cloudy.	" 03	86	N. Stormy.	" 03	77	N.E. Cloudy.	

True Extracts,

R. H. BUCKLAND,

Secretary, Assam Company.

Rungpoor, Upper Assam from Mr. J. Owen, Assistant Assam Company.

Situated on one of the Naga Hills, East of Jaipoor, Upper Assam, and distant 12 or 14 miles, at an elevation of nearly 1500 feet above the level of the sea, observed

June 1st. Hot sultry day, slight S. S. W. breeze.

„ 2d. Rain from 6 A. M. to noon ; wind throughout variable.

„ 3d. Hot sultry day. Slight S. S. W. breezes.

„ 4th. Very hot day, wind variable.

„ 5th. Ditto ditto,

„ 6th. Rain at noon. Fresh breeze from the Southward and Westward.

J. OWEN.

Darjeeling. Latitude 27° 7' N. Longitude 88° 21' E. from Dr. Campbell, Resident. N. B.—Elevation about 7,000 feet.

“ I beg leave to furnish the following particulars from memory, of the state of the weather at this place during the 2nd, 3rd, 4th, and 5th. About midnight of the 2nd, it commenced blowing strong gusts from the N. W., and continued to do so all day of the 3rd, accompanied by showers. On the 4th, we had stormy weather and rain, the wind blowing from the S. E., and the weather continued unchanged during the whole of the 5th ; although the wind was strong throughout the greater part of the 3rd, 4th, and 5th, it did not amount to a storm, at least it was not such a storm as we experienced here on the 4th and 5th of May 1840.”

Mozuffurpore in Tirhoot. Lat. 26° 8' N. Long. 85° 31' E.

A memorandum from my friend, Mr. Samuells, Magistrate of Tirhoot, says,

“ After much inquiry, I cannot learn that there is any person in the district who keeps a meteorological register, or indeed any memoranda of the weather. My recollection, however, of the state of the weather at the time of your great storm, agrees precisely with that of the Doctor, and who moreover tells me, that he has invariably remarked the same appearances in the weather here during the May and October gales in the Bay of Bengal. The weather, according to our recollection, was

hazy, the sky covered with light fleecy clouds, and there were light airs, with occasional gentle breezes from the East, the quarter from which the wind almost invariably blows in Behar during the rainy season. The force of the gale would appear to have expended itself among the Rajmahal hills.

*Tirhoot, Amooah. Latitude 26° 33' N. Longitude 85° 24' E. from
J. B. Higginson, Esq.*

Knowing that you gladly receive any information respecting winds and weather during the late hurricane, I send the following extract of a letter from Amooah in Tirhoot:—

“ During the late dreadful storm you had in Calcutta, we had a steady, but rather strong easterly wind, with dark hazy, sultry and very oppressive weather, with every appearance of bad weather setting in; and although the light scud went with the wind, *the upper dark masses of clouds were whirling about in a most extraordinary manner, but driving towards the S. E.* The sun was not visible for two days.”

Gya. Latitude 24° 47' N. Longitude 85° 12' E.

I have been favoured with a report from this station from W. St. Quintin, Esq. the Magistrate, as follows:—

21st May.—At 20 minutes before 9 o'clock A. M., we had two smart shocks of Earthquake, from West to East; for some days before, and after this, the sky had a white, thick, hazy appearance. The heat of the weather was very oppressive. Thermometer never under 90°, and after at 95° in the house, and 115° in the shade of the outside verandah.

22nd May.—Hot, thick, and cloudy, slight rain, wind, storm and thunder. Wind Westerly.

23rd „ Cloudy and hot wind from the West.

24th „ Dreadful heat, wind S. W.

25th „ Ditto,

26th „ Ditto, wind N. S. E. and W.

27th „ Ditto, wind W. and N.

28th „ Ditto.

- 29th „ Ditto,
 30th „ Cloudy and windy, in gusts from the E., and cloudy.
 31st „ Ditto.
 1st June.—Ditto.
 2nd „ *Ditto, clouds driving about in all directions, and wind very gusty.*
 3rd „ Cooler, cloudy, slight rain, wind S. E., cloudy.
 4th „ Rainy and cool strong S. E. wind, very gusty and cloudy.
 5th „ Steady rain in the morning, very cool S. E. wind, and strong Easterly in the evening.
 6th „ Cool and cloudy, East wind at, mid-day a strong, hot, damp Westerly wind set in.
 7th „ Strong Westerly hot, damp wind.

Patna. Latitude 25° 37' N. Longitude 85° 15' E.

From E. C. Ravenshaw, Esq. C. S.—“ Observing in the papers that you wish to be informed of the places to which the storm of the 3rd instant did not reach, I beg to mention, that we had no storm at Patna, but only a slight fall of rain ($\frac{11}{100}$ of an inch) on the 4th from the East. On the 10th, however, we had a violent storm from the West, at 8 p. m.; it lasted about two hours. There was very little thunder, at least it was not very loud, but blew with great violence, up-rooting several trees in my compound. My pluviometer was upset and broken, so I cannot state the amount of rain, but it must have been two inches I think.”

E. C. RAVENSHAW.

From Ghazeepoor, Latitude 25° 35' N. Longitude 83° 33' E. by Lieut. Sherwill, Revenue Survey, on the Ganges between Cawnpoor and Dinapoor.

30th May, 1842.—Steady Westerly wind in forenoon. In afternoon, strong East wind and cloudy.

31st May.—Strong East wind all day, and cloudy.

1st June.—Strong Easterly wind until 3 p. m., when the wind suddenly ceased, heavy clouds commenced rising in the West; at half past 3 p. m. a furious hurricane burst forth from the West, which lasted

for three hours; during the whole of the first hour, the atmosphere was perfectly darkened with dust and clouds, so dark, that *nothing* was visible, the hand was *scarcely* visible when held against the sky, the sky itself was barely discernible from the earth, so complete was the darkness. At 4 p. m. or one hour after the first commencement of the storm, heavy rain fell, the wind increased in violence, and the noise and roaring of this wind was perfectly awful and terrific; the water of the Ganges was driven far over low sand banks that a few minutes before had been perfectly dry. The hurricane, for I can call it nothing less, was at its height about 6 p. m., when it subsided as suddenly as it had commenced; all was then quiet and refreshed, for, before the commencement, the air was heavy, and the heat almost insupportable. The Manjee of my boat would not proceed, saying he was certain something was about to take place. I expected a return of the earthquake, which was felt at Cawnpoor, Dinapoor, and Chunar on the 21st May, 1842. The East wind set in again immediately the storm had passed away, and blew steadily all night; my position during the storm was about fifteen miles to the S. W. by W. of Ghazeepoor. At Ghazeepoor, the storm was seen travelling on the South bank of the river, (right bank,) distant a few miles to the South. It was seen about 4 p. m. travelling due East.

2nd June.—On the morning of the 2nd, the wind blew steadily from the East until 11 A. M., when it increased and blew a heavy gale for one hour; at noon it veered round to the North, and continued blowing a steady stiff breeze till sun-set, when it failed entirely.

3rd and 4th June.—Fine weather, moderate East wind and showers.

5th June.—Steady East wind; at 7 p. m. a furious Easterly gale set in, which blew for two hours. Heavy lightning to the N. W., where was collected a heavy bank of clouds, which disappeared during the night. I was then about fifteen miles to the S. E. of Ghazeepoor.

6th June.—At noon, a heavy Northerly gale commenced, and blew for two hours. The wind was excessively boisterous, the heavens overcast with dark clouds. Position about ten miles North of Ghazeepoor.

7th and 8th June.—Steady Westerly wind all day, fine weather.

W. S. SHERWILL, *Lieut. R. A.*

Surveyor.

Journal kept at Lehra, in the Goruckpoor district. Latitude about 27° 0' N. Longitude 83° 30' E.

1st June.—At daybreak a few clouds in the North, 8 A. M., rain from the North; thunder and lightning and heavy rain. Noon cloudy, slight rain at intervals, light E. wind. Evening fine, with many clouds, light E. wind.

2nd June.—Light showers during the past night. Morning steady rain, light E. wind. Noon, cloudy. Evening fine, with a few clouds

3rd June.—Light Easterly wind, a few clouds, very sultry.

4th June.—Wind East, but scarcely perceptible all day. Morning, a few clouds. Noon cloudy. Evening, nearly cloudless.

5th June.—Rain during the past night. Morning, heavy rain. Noon cloudy. Evening nearly cloudless. Wind East all day, but so slight, as to be hardly perceptible.

6th June.—Heavy rain during the latter part of the past night. Morning, cloudy. Noon and evening, a few clouds, light East wind all day.

7th June.—To the 20th; the wind was almost without exception Easterly and light, the weather more or less cloudy, and a few drops of rain occasionally fell. From the 3rd to the 20th, the heat was very oppressive. The last was a day of nearly continued rain.

Allahabad. Latitude 25° 27' N. Longitude 81° 50' E. Lieut. Chamier, Ordnance Department.

I should observe, that this account is from *memory*; you will therefore be able to estimate its value, and reject it, should more authentic accounts reach you from this station. I have added an extract from my register of the Thermometer (Fahrenheit's,) in case it should be of any use.

Memo.—On the morning of the 2nd instant, about 8-30, large masses of clouds formed in the N. W., and came rolling up in a S. E. direction. About 9, the wind blew with considerable violence from the N. W., and so darkened the air by raising the dust, that it was impossible to see across the room. In half an hour, a heavy shower of rain fell; the wind gradually subsided, and by 11 o'clock A. M., the storm had cleared off. A few small trees were blown down, but I have not heard of any other damage being done. Since the storm, the wind has remained pretty steady at W. and N. W.

Register of the Weather, Koorsun Factory, left of the Ganges, and 2½ miles North of Allahabad Powder Works, June 1842; from J. Kelly, Esq.

Date.	SUNRISE.		NOON.		3 P. M.		SUNSET.		
	Fahrenheit.	Adie's Sympiesometer.	Fahrenheit.	Sympiesometer.	Fahrenheit.	Sympiesometer.	Fahrenheit.	Sympiesometer.	
June 1st	94.30	29.84 Moderate	99.0	29.64 Calm	101.0	96.60 Variable	98.0	13.74 Moderate	☾ 1st at 0 44 P. M. } ☉ 9th " 4 07 A. M. } From Rushton and Co.'s ☾ 15th " 10 45 P. M. } Almanac, which differs some- ☉ 23rd " 3 15 A. M. } what from the others.
" 2nd	95.0	.86 Light	83.30	.94 Moderate	89.0	.94 Light	90.0	.88 Light	A. M. N. Easterly breeze, calm at times 2 P. M. light Wsly. wind for ½ an hour. 3 30 a heavy sand squall from N. E., remainder moderate and cool, cloudy throughout
" 3rd	90.0	.96 Calm	92.0	.95 Light	93.30	.86 Variable	93.30	.84 Calm	Cool N. Easterly breeze during the night. 9 A. M. a smart squall from N. W. with thunder and heavy rain, continuing till near 1 P. M. remr. N Easterly light wind, cloudy throughout.
" 4th	92.0	.98 Vble. Nly.	94.0	.88 Variable	94.30	.76 Vble. Wly.	94.0	.74 Variable.	First and latter parts calm, middle variable light wind N., towards East cloudy weather.
" 5th	89.30	.98 Light	95.0	.84 Light	98.0	.72 Light	97.0	.70 Light	Light wind throughout, varying between W. round by N. to N. E., cloudy weather.
" 6th	93.30	.96 Variable	93.0	.86 Light	92.0	.30 Light	93.0	.96 Calm	Westerly light breeze throughout, during afternoon some distant thunder.
" 7th	95.0	.88 Light	95.0	.78 Strong	98.0	29.72 Strong	98.0	.74 Light	Variable light airs and calm at times, cloudy weather. Westerly wind throughout, 1st and latter parts light, middle strong breeze, cloudy weather.

NOTE.—The Sympiesometer is kept in a small office room 16X16, built due East and West, with doors on each side, and the instrument is placed on the Southern wall.

Extract from the Meteorological Register, kept at the Lucknow Observatory, Latitude 26° 51' 18", Longitude 80° 58' 35", from Major Wilcox, Astronomer to His Majesty the King of Oude.

Month and Day.	Barometer.		Thermometer.		Direction and strength of the Wind (by Lind's Wind-gauge), Description of Clouds and General Remarks.		
	Mean Height.	Mean Temp. of Merc.	Mean of Standr.	Mean of Dry.			
May 28	29.332	93.2	98.7	99.3	75.4		
" 30	29.262	94.4	98.5	99.0	78.8		
" 31	29.206	95.4	98.0	98.6	79.4		
June 6	29.116	92.7	94.3	96.0	79.8		
" 7	29.122	93.3	97.6	99.0	76.5		
" 8	29.205	92.8	105.9	98.4	75.4		
The general direction of the wind was from the N. W. Sky covered with cumuli, and atmosphere thick with dust. Easterly wind till 11 A. M. and since then Northerly. Sky clear throughout the day. The wind variable between 1 A. M. and 3 A. M. and blowing fresh. From 5 A. M. its direction was altered to the E.; its average strength .05, clear sky in the evening, dusty towards the horizon. The wind variable between 1 A. M. and 9 A. M. blowing from the E., E. N. E., N. E., S. E., and N. W., but from 11 A. M. it changed to the W.; its average strength .05. Cloudy day. The wind variable, blowing from 1 to 3 A. M. from the S. W.; from 5 A. M. to 3 P. M. from the W.; and since then North-westerly and Westerly; its average strength .13. Cloudy day. The general direction of the wind was from the W., excepting between 11 A. M. and 1 P. M., which was North-westerly, cloudy day.							
Date and Time of Observation.	Barometer.		Thermometer.		Wind.	Cloud.	REMARKS.
	Height.	Temp. of Merc.	Standr.	Dry.	Direction.	Mass (1-10)	
June 1st	29.160	95.3	92.8	92.8	E.	.05	Clear.
0 48 m	132	93.8	90.7	91.2	E.	.05	
* 2 57	4 44	125	92.5	88.6	E.	.03	
6 44	148	90.7	88.1	89.0	E.	.20	
8 44	160	93.0	92.8	94.4	E.	.15	
10 45	164	95.9	98.0	99.4	E.	.15	Atmosphere thick with dust.
P. M.							
0 44	135	96.9	100.3	99.8	E.	.20	
2 45	099	96.8	97.3	98.2	E.	.10	
4 44	069	96.0	96.1	97.1	E.	.08	
44	103	94.7	92.5	93.0	E.	.10	Ditto ditto
8 44	138	91.3	88.5	89.4	E.	.10	
10 47	188	91.0	87.5	88.0	E.	.10	

* N. B.—The hour is reduced to Civil time. Observatory is about 360 feet above the level of Calcutta, the average difference of height of the Barometrical columns at the two places is 380.

Ditto ditto with dust.
Ditto ditto ditto.
Overcast with dust.
Somewhat obscure with dust, towards the horizon.
Ditto ditto ditto
Clouds to the E. and wind blowing in gusts.
Ditto ditto ditto.

Extract from the Meteorological Register, kept at the Lucknow Observatory.

Date and Time of Observation.	Barometer.		Thermometer.			Wind.		Cloud.		REMARKS.
	Height.	Temp. of Merc.	Standr.	Dry.	Wet.	Direction.	Strength.	Mass (1-10)	Description.	
June 2d										
h. m.	o	o	o	o	o					
0 46	29.128	90.4	86.2	87.0	76.2	E.	.15	10	Cumuli, ...	[from the E. Lightning flashing
2 45	142	90.3	85.2	86.0	77.2	E.	.05	8	Cumuli.	
4 45	150	89.5	83.4	83.8	.....	E.	.05	.....	...	Clear.
6 45	195	89.3	83.7	84.7	.....	E. S. E.	.08	9	Cirro-cum. to the N. or E. & nimbus to the W. & S. ...	Thunder, with a few drops of rain.
8 45	260	89.1	85.7	86.5	76.2	E.	.15	10	Cumuli.	
10 45	223	89.6	85.3	86.1	76.2	E.	.15	10	Cumuli.	
P.M 0 45	234	89.0	86.4	87.2	76.9	E.	.10	10	Cumuli.	
2 45	174	90.5	87.0	88.2	78.2	E.	.05	10	Cumuli.	
4 44	148	90.7	89.2	90.3	77.6	E.	.02	10	Cumuli.	
6 44	140	90.7	88.0	88.6	78.0	E.	.03	8	Cirri, cirro strati and cumuli.	
8 47	187	89.6	86.7	87.0	77.3	E.	.02	7	Cumuli and cum.	
10 45	192	88.5	85.8	86.3	77.8	E.	0	10	Cirri. [strati.	
June 3d										
0 45	29.174	88.0	85.2	85.7	78.0	E	0	9	Cumuli & cirri.	
2 47	178	87.4	85.0	85.6	77.7	E.	0	8	Cumuli & cirri.	
4 45	178	87.3	84.5	84.6	77.8	E.	.02	8	Cumuli & cirri.	
6 45	204	88.0	84.8	86.0	78.1	E.	0	9	Cirro cumuli.	
8 45	250	90.0	88.4	90.0	79.0	E.	.01	10	Cirri.	
10 44	246	91.0	87.4	89.5	80.2	S. E. S.	.02	7	Cirri, cirro cumuli & cumuli.	
P.M 0 47	202	91.8	91.2	92.7	81.7	E.	.02	7	Cum. & cir. cum.	
2 46	146	92.0	94.1	96.2	81.3	E.	.02	5	Cumuli.	
4 45	114	91.8	95.2	95.8	81.4	S. E.	.02	6	Cumuli.	
6 44	120	92.1	93.7	94.5	80.3	E.	.02	6	Cumuli.	
8 45	146	91.4	90.1	90.4	79.8	E.	.02	.....	... ..	Clear.
10 45	176	91.7	88.4	88.2	80.4	E.	.01	.....	... ..	Clear.
June 4th										
12 46	29.150	91.2	86.7	86.6	80.5	E.	.02	.....	... ..	Clear.
14 45	142	90.2	85.6	85.5	79.4	E.	.02	.....	... ..	Clear.
16 45	138	88.8	84.8	85.2	79.1	E.	.02	.....	... ..	Clear.
18 45	151	88.2	86.8	88.4	80.4	E. S. E.	.05	.....	... ..	Clear.
20 45	176	91.4	91.7	94.0	81.0	S. E.	.03	.....	... ..	Clear.
22 45	175	93.5	96.3	98.1	80.5	S. S. W.	.10	3	Cirro cumuli.	
0 47	135	93.0	98.8	100.7	.....	E. S. E.	.07	7	Cirro cumuli and cumuli.	
2 46	083	93.2	101.6	103.1	80.8	S.	.06	8	Ditto ditto.	
4 46	079	94.0	95.2	95.9	81.4	E. N. E.	.05	10	Cumuli.	
6 44	084	93.3	93.1	93.5	80.4	E. S. E.	.08	7	Cirro-cum.&cum.	
8 44	138	92.0	89.7	90.2	79.2	E. S. E.	.05	10	Ditto ditto.	
10 44	188	91.2	89.5	90.2	79.0	E. S. E.	.05	10	Ditto ditto.	

Mean height of the Barometer during the week previous to the storm, 29.332.

R. WILCOX

*Agra. Lat. 27° 12' N. Long. 77° 56' E. from Dr. Balfour, Surgeon
to the Hon'ble the Lieut. Governor of the N. W. Provinces.*

	Day of month.	Thermometer at 9 30 A. M.	Sympiesome- ter at do.	Wind at do.	Thermometer at 4 P. M.	Sympiesome- ter at do.	Wind at do.	
May.	28	91½	23.08	W. N.	93	28.91	NW.	} During three days nothing very remarkable in the weather, the ordinary hot wind of the season blowing.
	29	92½	„ 03	N. W.	94½	„ 87	NNW	
	30	93	„ 00	N. W.	94½	„ 84	NW.	
	31	94	28.91	N. W.	95	„ 74	NW.	
June.	1	94½	„ 82	N. W.	96	„ 62	NW.	} 1st. Wind very strong and rather gusty, almost a gale, during the night shifted to East and blew fresh; 9 30 of 2nd wind at South, shortly afterwards backing to East, at which it continued steady. 3rd. Cloudy during forenoon. 5th. Cloudy and rain drops in morning; at 5 P. M. wind to S. with squalls and again settled at Westward. 6th. Shower for two minutes from N. W. at noon.
	2	94	„ 86	S.	94½	„ 73	E.	
	3	93	„ 89	E.	93½	„ 75	Ey.	
	4	98½	„ 85	Ey.	94	„ 70	NWy.	
	5	93½	„ 83	W.	94½	„ 72	W.	
	6	93½	„ 86	S. W.	94	„ 72	W.	

The temperature is taken in a room, where is neither punka nor tatties; the direction of the wind in the tables is that at the time of observation, and may not be correct to a point, but it is nearly so. Of the shift on the night of the 1st, I can give no further account than I have entered in my notes. I was struck with it at the time as curious, succeeding to such a strong N. W. wind with a falling glass.

I commence the tables from the 28th ultimo, to shew the steady fall of the Sympiesometer. On that day it stood at the average for the month; viz. 29° 08' A. M., and 28° 93' P. M., the day before, however, it was as high as 29° 04', and after the 6th, it continued to rise till the 11th, when it reached 29° 15', and has since gradually fallen to about 29, indicative I hope of the approach of the rains. As Agra is about 500 feet, (I believe) above the sea, allowance must be made for that height in comparing these tables with others; to aid this, I give the average for the month of April here compared with the same in Calcutta; should a longer series of averages be desirable, I can give you the same for two years nearly.

	Morning.	4 P. M.
Agra,.....	29° 15'.....	29° 01'
Calcutta,	29° 74'.....	29° 65'
	<hr/>	<hr/>
Diff.....	— .59'	— .64'

JOHN BALFOUR,

Assist. Surgeon, Agra.

Dadoopoor in the Protected Sikh States. Latitude 30° 12' 12" N. Longitude 77° 23' 45" E., from 28th May to 6th June, 1842. From Capt. W. E. Baker, Engineers.

The height of Dadoopoor above the level of the sea is from 900 to 1000 feet, but in consequence of a small quantity of air having got into the barometer tube, a correction of +0.083, should be applied, besides that for temperature and elevation.

W. E. BAKER,
Bengal Engineers.

Extract of the Meteorological Register kept at Dadoopoor, from 28th May to the 6th of June 1842.

Dates.	AT DAYBREAK.					AT 10 A. M.					AT 4 P. M.					AT 10 P. M.					REMARKS.				
	Barometer.	Thermometer.			Rain Gauge.	Barometer.	Thermometer.			Rain Gauge.	Barometer.	Thermometer.			Barometer.	Thermometer.									
		Attached.	Detached.	Wet Bulb.			Attached.	Detached.	Wet Bulb.			Attached.	Detached.	Wet Bulb.		Attached.	Detached.	Wet Bulb.							
1842.																									
May	28	28.722	85	0.81	0.78	0	0.28.762	101	0	100	0.85	0.28.630	108	0	107	0.85	0	0.28.626	94	0	93	0.83	0	Clear light variable wind.	
"	29	28.602	84	0.83	0.75	0	0.28.684	105	0	104	0.88	0.28.602	110	0	109	0.88	0	0.28.602	93	0	92	0.80	0	Do. N. W. do.	
"	30	28.594	84	0.83	0.77	0	0.28.672	100	0	99	0.85	0.28.582	114	0	110	0.87	0	0.28.590	94	0	93	0.78	0	Do. do. variable do.	
"	31	28.542	82	0.81	0.74	0	0.28.616	103	0	102	0.88	0.28.482	111	0	112	0.88	0	0.28.464	94	0	92	50.81	0	Do. do. do.	
June	1	28.486	86	0.85	0.80	0	0.28.506	102	0	101	0.89	0.28.382	112	0	110	0.91	0	0.28.421	91	0	90	0.83	0	Do. do. do.	
"	2	28.494	85	0.84	0.78	0	0.28.564	93	0	92	0.83	0.28.492	106	0	105	0.89	0	0.28.508	89	0	88	0.83	0	Do. strong Easterly do.	
"	3	28.520	83	0.82	0.79	0	0.28.580	96	0	95	0.83	0.28.452	106	0	105	0.82	0	0.28.570	91	0	90	0.85	0	Do. light do. do.	
"	4	28.462	86	0.85	0.82	0	0.28.520	99	0	98	0.88	0.28.402	109	0	108	0.86	0	0.28.432	93	50	92	0.85	0	Do. do. do.	
"	5	28.402	84	0.83	0.81	0	0.28.484	93	0	92	0.85	0.28.410	104	0	103	0.81	0	0.28.440	92	0	91	0.85	0	{ A. M. Lt. Easterly wind. P. M. a squall from N.	
"	6	28.486	87	0.86	0.82	0	0.28.510	67	0	96	0.88	0.28.420	105	50	104	50	84	0	0.28.441	95	0	93	0.87	0	{ W. with a shower. Clear light N. W. wind.

9 N. B.—The Thermometer has ranged in the house under tatties from 16th of May to 6th of June 1842, from 90° to 96°, and was generally above 92°, and the previous four years it was generally between 86° and 88° till the setting in of the rains.

WILLIAM DAWE, Conductor,
Delhi Canal Department.

Almorah. Latitude 29°-35' N. Longitude 79° 40' E. from J. H. Batten, Esq. Assistant Commissioner of Revenue, Kemaon.

This valuable and graphic account of what seems to be the ultimate effect of the storm, which I owe to the polite attention of Mr. Batten, will be perused by the Meteorologist with much interest.

“As storms are frequent in the hills, (though this year has been excessively dry,) and the great rains are generally preceded by the “*chota bursât*” at the end of May or beginning of June, I did not make any particular observations at the time of your storm; but as the smallest information as to the weather at that period would appear to be valuable, I beg to send you these few lines.

“The weather at Almorah, during all May, was unpleasantly warm *for the hills*. Up to the 18th May, the Thermometer in the house shewed a maximum heat of 75°, and a minimum of 73°, and I often saw the mercury at noon day 74°, and at midnight still standing unmoved at 74°. After the 18th, the heat began to increase, and from that day till the 30th, the minimum height of the mercury was 75°, and the maximum was sometimes, though rarely, as high as 80°; but for the greater number of days it attained to 77°. On the 21st, there occurred a dry North-wester at evening, and from the numerous ploughed fields which surround the station, arose a regular storm of dust, such as is seen on a larger scale in the plains. During the whole month, the atmosphere was unusually thick and hazy, and the mountains, only two miles distant in a horizontal direction, were obscured from view. During the hot dry weather in the hills, this hazy appearance is usual, and whenever the haze becomes very thick indeed, *at the horizon*, rain may generally be expected to follow. Here and there slight rain did fall, and the appearance of the clouds, piled up in cumuli at the horizon from S. E. to S. W., from which a constant scud issued and passed over towards the Snowy range, was highly electrical. During the last week of the month, the wind which had been at S. W., with dry N. Westers occurring nearly every evening, changed to the N. E., E., and S. E. On the 30th and 31st, the weather was very sultry, and the haze extraordinarily thick. On the 31st, from 4 P. M. to 6 P. M., there was a fine fall of rain, the wind veering from N. W. to N. E. On that evening, the Thermometer in the house fell from 80° to 72°; and in the verandah it was as low as

70°; the mists now began to flit on the hill sides. Wednesday the 1st of June was very sultry, the Thermometer in the house 80°, all day sky cloudy, and the near atmosphere hazy to a degree. At 8 p.m. the wind became a gale from the N. W., and brought with it a flood of rain, which lasted for two hours with tremendous violence, excavating deep ravines in the hill side, and changing the shallow mountain streams into deep and tumultuous torrents. The 2nd and 3rd were cloudy without much wind, and a fine shower of rain fell on each day. Maximum of Thermometer 75° in the house, wind veering from S. W. to N. W., and round by N. to E. Saturday the 4th was a very sultry, and hazy day, but from 9 p.m., the wind blew with *great violence* from N. E. to S. E., lightning vivid, with constant loud thunder, and rain fell in torrents. The weather cleared at 10 a.m. on the 5th, and from that time till yesterday, the 15th, there only occurred at Almorah, (to which place my observations are strictly confined,) one smart shower on the afternoon of the 10th; the sultry haze returned with strong W. and S. W. winds, and the Thermometer latterly attained to a height of from 77° to 81° in the house. At last, yesterday the 15th, the heat seemed to have attained its climax. But as the scud of clouds still continued to be blown strongly from the *West*, I hardly expected rain, though the lightning was vivid from heavy cumuli at the S. E. corner of the horizon. Between 8 and 10 p.m., however, the wind changed to N. W. and round by N. and N. E. to E. and S. E., and at the latter hour *the rains* set in with a vengeance. Thunder and lightning all night, with strong winds and constant pouring of water from the heavens. To-day the rain is steady, and the misty clouds are rolling about the hills, and into the windows. Thermometer at noon in house 72°. My house is the lowest in the station, and is about 5,260 feet above the sea. Common Barometers with the usual scale of degrees, are of course of no use here.

I see by the Delhi Gazette of the 11th, that on the 3rd instant there was no storm at Bareilly, and that a heavy storm without rain occurred at that place on Wednesday the 1st, and that the rainy weather which we had up here was, from the appearance of the sky, suspected. I also perceive, that the Bareilly correspondent of the Delhi Gazette describes the height of the Thermometer on the 30th ultimo as 96°, with tatties and punkahs; so that even with our usual

heat, at that time at Almorah, there was a difference in our favor of 15 degrees. The highest point of ground in the Cantonments of Almorah is, I may mention, about 5,500 feet above the sea.

J. H. BATTEN.

STORM REPORT, DEESA NEAR POONAH, 4TH JULY 1842.
Extract from the Meteorological Register, 2nd or Queen's Royal Regiment, for June 1842.

Date.	Hour.	Ther.	Wind.	Weather.
		°		
June 1	6 A. M.	86	S. W.	Morning overcast; watery to the S. W., soft breeze.
"	3 P. M.	98	S. W.	Mid-day, fresh breezes.
"	6 P. M.	97	S. W.	Clear (fresh or strong breezes may be here supposed.)
"	9 P. M.	96	West	High winds with dust.
" 2.	6 A. M.	86	South	Overcast, fresh soft breeze with watery fleecy clouds.
"	3 P. M.	97	South	High winds, with volumes of dust.
"	6 P. M.	95	S. W.	Ditto.
"	9 P. M.	92	N. W.	Fresh breezes and clear.
" 3.	6 A. M.	87	South	[clouds.] Few drops of rain at 4 A. M., overcast watery bank and
"	3 P. M.	97	South	Fresh breezes, (cloudy may be here supposed.)
"	6 P. M.	97	South	Squally, clouds to the Southward.
"	9 P. M.	93	South	<i>Hard gales and squalls,*</i> with heavy dark clouds and [volumes of dust.]
" 4.	6 A. M.	86	South	Fresh breezes and cloudy.
"	3 P. M.	96	S. W.	Ditto.
"	6 P. M.	95	South	Banks.
"	9 P. M.	94	S. E.	Strong gales and clear.
" 5.	6 A. M.	86	South	Fresh breezes and cloudy.
"	3 P. M.	98	South	Strong breezes and cloudy.
"	6 P. M.	97	South	Light banks.
"	9 P. M.	94	South	Strong gales.
" 6.	6 A. M.	86	South	Strong breezes, and very cloudy.
"	3 P. M.	96	South	Ditto ditto.
"	6 P. M.	96	South	Banks and clouds.
"	9 P. M.	92	S. W.	Strong gales.
" 7.	6 A. M.	86	S. W.	Fresh soft breezes, and very cloudy.
"	3 P. M.	95	S. W.	Strong breezes.
"	6 P. M.	94	S. W.	Thick dust, haze, strong breezes.
"	9 P. M.	91	S. W.	Fresh gales.

Full Moon.—From this period the wind continued in the S. W. for more than a week, with the usual weather of the season.

R. B. A. HUNTER,

Assistant Surgeon, in Medical charge 2nd or Queen's Royal Regiment.

N. B.—The direction of the wind not to be depended upon *exactly to a point*, and any change of direction between the periods of observation not noticed.

During the hot season, high winds from the S. and S. W. always darken the air, more or less, with dust, and particularly at the commencement of the S. W. monsoon.

* This was so heavy, that we entertained great fears at the time for the Shipping in Bombay and on the East coast.

The late Storm at Calcutta.

TO THE EDITOR OF THE BOMBAY TIMES.

SIR,—Mr. Piddington of Calcutta being very anxious, it appears, to obtain all the information he can, relative to the state of the weather in all parts of India, about the period of the recent storm, I beg to furnish him, through your journal, with the following notes from my Weather-Book, and only regret that they are not more detailed:—

State of the weather at Chowpatty, (3 miles from the fort of Bombay,) from the 1st to the 6th of June 1842.

1st June.—Morning, sky overcast; temperature very sultry; wind, N. W.—Day cloudy and hot.—Evening, sky overcast; sultry; wind N. W.

2nd June.—Morning, sky overcast; wind N. W.—Day very hot and oppressive; hazy and cloudy. Thermometer 90° at 12 o'clock.—Evening, sky overcast; black and lowering appearance in the S. W. quarter; wind blowing strongly from N. W.

3rd June.—Morning, sky overcast; wind N. W.—Day hot, cloudy and hazy.—Evening, sky overcast; wind N. W.—A heavy shower of rain fell in the fort district last night.

4th June.—Morning, sky overcast; a slight shower of rain after 5 o'clock; wind N. W.—Day hot, cloudy and hazy.—Evening, cloudy; wind N. E. temperature very sultry; a few small showers of rain. Some rain fell last night.

5th June.—Morning, sky overcast; sultry; wind N. W.—Day hot and cloudy, with a thin haze; a few showers of rain.—Evening, cloudy and very sultry; wind N. E.

6th June.—Morning, sky overcast; sultry; a little rain; wind easterly.—Day, very hot. Thermometer 92 degrees at 2 o'clock.—Evening, cloudy; fine showers of rain; temperature oppressively close and sultry; wind N. W.

The most remarkable change observed by me during the above period, was that of the wind, which was North-westerly during the mornings, till the 5th; when it veered to the East—its usual direction at that time of the day; and this circumstance, as well as its blowing

for two evenings, (the 4th and 5th,) from the North East, led me to anticipate, in common with others, a serious disturbance to the equilibrium of our atmospheric system.

Your's obediently,

BOREAS.

Chowpatty, 22d June, 1842.

The Calcutta Hurricane of the 3rd and 4th June, 1842.

When we promised in our last to revert to this subject, we were under the impression, that we should have been able to lay our hands on a larger body of facts, to have placed beside those supplied by Mr. Piddington, than that wherewith we have as yet had it in our power to supply ourselves: we despair not as further returns come in, yet to obtain information bearing on that collected at Calcutta. We subjoin an extract from the register of the Bombay Observatory for the 2nd, 3rd, 4th, and 6th of June,—the 5th being Sunday, when no observations were made. On the 1st, the Barometer had not departed from its usual average. On the 2nd, it had fallen somewhat, but that not much; and it was on the morning of the 3rd that it first began to assume symptoms of extreme irregularity. This state of matters continued all over the 4th. By the 6th, the instrument had assumed its ordinary monsoon level. As formerly stated, the belief amongst the natives was universal, that a tempest might be looked for about the 5th; nothing came, however, and the falling of the instrument was generally, and too correctly, assumed to have been occasioned by a tempest raging at a distance.

Barometer uncorrected.

Time.	2nd.	3rd.	4th.	6th.
6 A. M.	29.608	29.596	29.530	29.610
7	.630	.618	.560	.620
8	.656	.634	.572	.638
9	.660	.640	.592	.656
9½	.664	.636	.592	.660
10	.664	.636	.592	.664
10½	.656	.636	.592	.664

Time.	2nd.	3rd.	4th.	6th.
11	29.650	29.616	29.592	29.664
0	.636	.616	.580	.656
1 P. M.	.620	.608	.570	.644
2	.612	.594	.548	.630
2½	.608	.586	.542	not obsd.
30	.600	.576	.540	ditto.
3½	.600	.576	.532	ditto.
4	.600	.560	.532	ditto.
4½	.600	.558	.532	.616
5	.596	.552	.536	.616
5½	.600	.558	.538	not obsd.
6	.608	.558	.532	.624
7	.614	.560	.532	not obsd.
8	.624	.572	.562	ditto.
9	.626	.580	.562	ditto.
9½	.620	.576	.562	ditto.
10	.620	.576	.562	ditto.

[*Bombay Times*, June 22, 1842.]

Lohurduggah, Ramghur district. Latitude 23° 28' N. Longitude 84° 50' E.

“The storm of the 3rd did not reach this length. We had a few puffs of wind all round the compass, with tolerably heavy showers all day, but nothing more.”

22nd June, 1842.

T. M. TAYLOR.

Sumbulpoor. Lat. 21° 33' N. Long. 83° 47' E. from Messrs. Willis and Earle, Calcutta, June 24, 1842.

In a letter of June 20th, received this day from Mr. C. L. Babington of Sumbulpore, in answer to some inquiries made of him in our letter of the 15th instant, he says,

“With regard to the late gale we did not experience its effects here. The rains were ushered in on the 1st instant, also on the 2d and 4th by the usual North-westerns, which only lasted a few hours

each time, and nothing particular in the state of the atmosphere, except that the rains did not set in with the usual masses of white clouds, which generally collect for three days previous, but merely as though a heavy shower might be expected."

JAS. WILLIS.

For the sake of easier and comparative reference, I have now, as in my former memoirs, arranged in tables, abbreviated notices of all the effects of the storms which the logs and reports offer, from about the middle of the Bay to Monghyr, Purneah, Dinagepore, &c. where the different storms appear to have broken up, and to have only been felt in those squalls of one or more hour's duration, which are called North-westers, North-easters, &c., according to the quarter from which they come. I have not carried the tables beyond the limits of the true rotatory storms, not considering it worth while to do so, and as rather complicating them for purposes of reference. In the summary which follows them, where the storms are tracked in detail, and the facts and arguments upon which the various results are founded are alluded to, and laid down, farther reference to that portion of the documents which relates to those places which were out of the limits of the storm will be made.

Tabular View of the Calcutta Hurricane, of 2nd and 3rd June 1842.

In the Bay of Bengal.

Date. and Time.	Name of Place or Ship.	Winds and Weather.	Lat. N.	Lon. E.	Bar.	Ther.	Simp.	REMARKS.
Noon 28th May, 1842.	Brig Algerine, ..	Variable dark masses of clouds and threaten- ing weather.*	° ' 10 4	° ' 92 26	28.60	..	..	Preparing for bad weather.
	Barque Ariel, ..	A. M. heavy squall N. E. to W. Noon continually veering as per Log. }	13 57	89 42	29.49	89	..	{ P. M. Continual veering, N. E. to S. W. Bar. 29.49 to 29.59, preparing for bad weather. }
	Barque Augustus,	Easterly and light to S. East, fine weather. }	19 16	85 53	29.58	..	..	{ Saw Manickapatam Pagoda N. W. by N. }
	Barque Norfolk,	Light winds and fine.	19 40	88 5	.. ..	..	..
	Barque Jno. Wm. Dare, ...	Calm and clear,	20 32	.. ..	.. ..	..	..	Current to N. E.

Western Coast of the Bay, from Madras to Kedgerie.

At Balasore,	No wind, air very op- pressive. P. M. light airs from S. E.	9 A. M. 29.69 3 P. M. 0.65 5 P. M. 0.60	88° 90 89½
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* See Captain Buckton's letter at page 977.

In the Bay of Bengal.

Date and Time.	Name of Place or Ship.	Winds and Weather.	Lat. N.	E.	Bar.	Ther. Simp.	REMARKS.
Noon 29th May, 1842.	Augustus,	Noon light breezes and calms. P. M. moderate N. Easterly. Midnight fine,	° ' 19 39	° ' 86 18	29.57	..	Off Black Pagoda.
	Panthea,	Calms and light Northerly airs,	18 54	.. ..	.. ..	..	Long. about that of Augustus.
	Jno. Wm. Dare,	Light and moderate N. E. to N. E. by E. ..	19 56	.. ..	29.50	..	Freshening at midnight.
	Algerine, ...	Increasing steady gale from S. S. W. to S. W. by W. heavy appearance,	10 45	91 20	28.70 28.56		
	Ariel,	Strong gales, heavy rain, sea, thunder and lightning. Wind variable from N. to West. P. M. the same,	13 59	90 07	29.44	88	Wind West to W. S. W. at midnight.
	Barque Norfolk,	Steady breeze N. E. & N. by E. to midnight,	18 32	87 15	.. ..	..	Midnight squally.

Western Coast of the Bay, from Madras to Kedgeree.

At Balasore,	Very close indeed as yesterday, light airs N. E. and cloudy, ..	9 A. M. 29.70 3 P. M. 0.64 5 P. M. 0.60	88 ¹⁰ 90 ¹ 90
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H. C. Pilot and Light Vessels.

Date.	Name of Place or Ship.	Winds and Weather.	Station.	Bar.	Ther.	REMARKS.
28th and 29th May 1842.	H. C. P. V. Coleroon,	Light winds and fine weather. Wind on 28th from E. b S. increasing. ..	Floating Light of Eastern Channel E. b S. in 7 faths. water.	29.86 Noon 29.88 4 P. M. 77	..	A Westerly set, on 28th P. M.
	H. C. P. V. Megna...	The same; threatening from Eastward on 28th, latterly fresh from NE. to N. N. E. ..	At anchor Kedgerree Green 6½ fathoms a breast of Flagstaff.			
	H. C. P. V. Cauvery,	Light breezes NE. to ESE. 8 P. M. 29th cloudy and lightning to the SW. ..	Cruising off False Point 25 to 37 fms.			
	H. C. P. V. Saugor,	28th, Calms throughout the day, light airs SE. to S. S. W. At night 29th fine, and moderate winds from SE. to E. throughout, ..	Outer Floating Light E. by N. ..			
	H. C. F. L. V. Beacon.	29th, Light airs first part. Midnight fresh breeze E. S. E. ..	..	P. M. 29.65 Noon .71 P. M. .50	
	H. C. F. L. V. Hope.	The same. ..	..	A. M. 29.55 Noon 29.55 29.55	88° 88 88

Date.	Vessel's Name.	Winds and Weather.	Station.	Bar.	Simp.	Ther.	REMARKS.
28th and 29th May 1842.	H. C. F. Light Ves- sel Beacon.	28th Light Southerly and S. S. E. winds and hazy. 29th, the same, P. M. fresh from S. E., thick and cloudy all round with drizzling rain. .. ..	.. ..	.. ..	.. ..	.. ..	{ 28th Bar. A. M. 29.74. Noon 29.74. P. M. 29.64. 29th A. M. 29.65. Noon 29.71. P. M. 29.50.
	At Kedgerree 29th, ..	S. to N. E. 3 P. M. N. E. squall and change of weather. .. ..	.. ..	29.40			
<i>From Kedgerree to Calcutta and Inland.</i>							
	CALCUTTA.*	Eastward, hazy, close. ..	.. ..	S. G. 29 617 574	.. ..	92.4 94.9	28th. 29th.

* The object of this Table being to exhibit the state of the weather at different points, in reference to my summary at the conclusion, I have not entered in it the different observations made at Calcutta, and close to it, as at Garden Reach and on the River, but have given my own, and the observations made at the Surveyor General's Office, (distinguished by S. G.) only, with here and there a note from the detailed accounts given in the preceding pages.—H. P.

In the Bay of Bengal.

Date and Time.	Name of Place or Ship.	Winds and Weather.	Lat.	Long.	Bar.	Ther.	Simp.	REMARKS.
Noon. 30th May.	Augustus, ..	Moderate N. N. E. P. M. squally. At 9 N. E. heavy squalls & showers.	19 1	86 39	29.34	..	..	Strong S. Westerly current.
	Panthea, ..	A. M. Light P. M. Northerly breezes, hazy and lightning,	18 57	.. ..	.. ..	..	..	Not far from the Augustus.
	Jno. Wm. Dare,	To Noon N. E. b E. P. M. N. E. increasing to a gale at S. E. b. E. at 6. At 12 S. S. E.	17 57	.. ..	29.50 6 P. M. 29.30	..	..	Heavy cross sea ; at 8 P. M. hove to.
	Algerine, ..	Increasing steady gale S. S. W. to S. W. b W. heavy weather, ..	12 04	90 02	28.70 to 28.56	..	..
	Ariel, ..	Day-light hard gales W. S. W. Noon more moderate. P. M. lying to,	13 39	88 58	29.41	..	..	{ Midnight W. S. W. more moderate, sea considerably fallen.
	Barque Norfolk,	Increasing N. N. W. Noon N. W. P. M. heavy squalls from N. W.	17 00	87 00	.. ..	..	..	{ Preparing for bad weather, steering to the Southward 6 knots.
	Brig Arethusa, ..	P. M. strong breezes S. W. .. ..	.. ..	.. ..	.. ..	..	..	11 P. M. a heavy fall of the Barometer.

Western Coast of the Bay to Kedgeeree.

MADRAS,	..	..	..	8 A. M. 29.75 4 P. M. 29.67 10 P. M. 29.73	89° 93 91
Batasore,	..	Light airs N. E. very heavy clouds to the Eastward. P. M. wind S. E.	..	9 A. M. 29.63 3 P. M. .60 6 P. M. .58	

H. C. Pilot and Light Vessels.

Date.	Vessel's Name.	Winds and Weather.	Station.	Barometer.	Ther.	REMARKS.
30th May 1842.	H. C. P. V. Coleroon,	Fresh breeze E. by N. to E. S. E. with passing squalls, P. M. threatening a gale from the Eastward	At anchor 7 fathoms, Floating Light Vessel E. by S.	Noon 29.77 4 P. M. 29.73	..	{ Veered to 100 fathoms and made all snug.
	H. C. P. V. Megna,	N. E. to N. N. E. fresh breezes and rain,	At anchor at Kedgeree. ..			
	H. C. P. V. Cavery,	Day light a squall with rain E. S. E. Noon fresh N. E. breeze. 2 30 the rain from East. 3 P. M. to midnight blowing hard } N. E., N. E. by N. and N. N. E. with frequent squalls and lightning to the East.	Conjong Bay N. N. W. to N. 32 fms. P. M. standing out to the East. ....	....	..	{ Unsettled threatening appear- ance all round, standing out to sea.
	H. C. P. V. Saugor,	Wind from the Eastward & a succession of squalls with rain throughout...	Noon out of soundings. Sea Horse W. N. W. 5 30 P. M. came to in 10½ fathoms. ..	....	..	{ P. M. not able to fetch the Coleroon on account of the hea- vy set to the West, came to in 10½ fathoms.
	H. C. L. V. Beacon,	Increasing with gloomy appearance to the Eastward from 8 A. M. At 4 P. M. strong wind E. to E. N. E. and N. E. hard squalls and dark to N. E. 8 P. M. to Midnight. Fresh at East and weather the same.	As before.	A. M. 29.62 Noon 0.62 P. M. 0.52	..	Westerly set.

Date.	Vessel's Name.	Winds and Weather.	Station.	Barometer.	Simp.	REMARKS.
30th May, 1842.	H. C. F. L. V. Hope,	Day light fresh E. S. E. 8 East. Noon E. to E. S. E. to sunset squally and drizzling rain. 8 P. M. to midnight the same. .... }	....	....	..	{ Lightning to Sd. and Eastward at 8 P. M. heavy sea, riding with 105 fathoms.
	At Kedgerree,	E. to N. E. light squalls with rain, .... }	....	29.35		

From Kedgerree to Calcuttia, and Inland.

| CALCUTTA, | East and S. East, | S. G. 29.546 | 92.5 |

In the Bay of Bengal.

Date and Time.	Name of Place or Ship.	Winds and Weather.	Lat.	Long.	Bar.	Ther.	Simp.	REMARKS.
Noon. 31st May,	Augustus,	8 A. M. fresh gales NE b N. to Noon. P. M. NE. veering to E. b N. by 7 and to midnight heavy squalls and much lightning,	18 38 N.	87 17	29.34	..	..	Black Pagoda to False Point,
	Panthea,	Freshening to a gale from N. N. E.	No obs.	..	..	..	..	Not far from Augustus,
	Jno. Wm. Dare,	2 A. M. South, 5 moderating, 10 increasing, noon wind about South. 1 P. M. SW. b. S. 11 P. M. S. b. W. .. ..	..	..	29.20	..	..	{ 7 P. M. more moderate, heavy cross swell from W. S. W. to midnight.
	Algierne,	Steady increasing gale from S. S. W. to S. W. b. W. from 29th,	13 52	88 41	28.70 to 28.56	..	..	Heavy suspicious weather.
	Ariel,	Moderate at times, but hard gales and squalls from W. S. W.	14 01	69 13	29.38	86	..	{ P. M. very heavy squalls, Bar. 29.38, lying to under storm staysails, midnight clearing a little.
	Barque Norfolk,	Heavy squalls N. W. Noon veering from W. to North till midnight.	15 20	88 10	..	..	..	Midnight cloudy and squalls.
	Brig Arethusa, ..	Increasing from S. W. b. W. and S. W.	14 20	84 29	..	..	..	High sea breaking over the brig.

Western Coast of the Bay to Kedgeeree.

MADRAS, .. ..	.. ..	8 A. M. 29.75 89° 4 P. M. 29.66 93 10 P. M. 29.73 93
At Pooree, .. ..	.. ..	.. ..
At Balasore, ..	.. ..	9 A. M. 29.54 86 .50 84 .48 84

Very heavy rain.

H. C. Pilot and Light Vessels.

Date.	Vessel's Name.	Winds and Weather.	Station.	Barometer.	Ther.	REMARKS.
31st May, 1842.	H. C. P. V. Coleroon,	Strong breeze from E. by S. squally, rain and lightning in the latter part, ..	At anchor 7 fms. Fl. Light E. by S. 4 P.M.	29.77 29.64	..	{ Heavy sea. At noon, Saugor { P. V. S. W. 4 S.
	H. C. P. V. Megna,	Squally N. E. to East with rain, latterly fresh gales from East,	At anchor & aground to 10 A. M.	....	..	Threatening weather.
	H. C. P. V. Cavary,	A. M. Blowing hard at N. E. by N. and N. N. E., squalls, rain and heavy sea. 10 A. M. to Noon the same from the Northward. Dark squally weather, every appearance of a gale. Noon a gale at N., heavy squalls, rain, and sea. 2 P. M. gale increasing. 4 Blowing a hard gale and increasing, veering to N. N. W. with hard squalls, showers and heavy sea. 8 P. M. hard gale N. N. W. in heavy puffs, lightning to East & Southward. Midnight a hurricane for 3 hours from N. N. W. in hard squalls and rain; lightning to the Southward, }	Hove to out of Soundings, off Conjong Bay, ....	....	..	{ Vessel laboring much, hove to under close reefed main topsail and fore topmast stay- sail.
	H. C. P. V. Saugor,	East to E. by S., with squally weather throughout the day,	At anchor as yesterday, ....	....	..	{ 120 fms. Cable out. Hove the Log, and found the set to the West to be $2\frac{1}{2}$ miles per hour, per Massey's patent Log.

Date.	Vessel's Name.	Winds and Weather.	Station.	Bar.	Ther.	REMARKS.
31st May. 1842.	H. C. L. V. Beacon,	A. M. Blowing hard at East. Noon heavy gusts. Sun- set E. S. E. 8 P. M. blow- ing hard at E. S. E. to Midnight, .. ..	.. ..	8 A. M. 29.38 29.38 29.34	85° 86° 86°	{ Throughout heavy squalls, rain and cloudy unsettled wea- ther. Riding with 160 fms.
	H. C. L. V. Hope, ..	1 to 4 strong Easterly and veering to E. N. E. and N. E. Noon strong at E. N. E. 4 P. M. at East, E. N. E. and N. E. 8 P. M. hard gale E. N. E. Midnight East & E. b S.)	.. ..	A. M. 29.38 Noon 29.55 P. M. 29.47	..	{ Squalls, rain and dismal wea- ther throughout.
	At Kedgeree, ..	N. E. squally with rain ; threatening, .. ..	.. ..	29.30		

From Kedgeree to Calcutta and Inland.

| CALCUTTA, | Easterly, scattered clouds, | | S.G. 29.50 | 90.0

In the Bay of Bengal.

Date and Time.	Name of Place or Ship.	Winds and Weather.	Lat.	Long.	Bar.	Ther.	Simp.	REMARKS.
Noon. 1st June.	Barque Augustus,	A. M. E. by N. 11 N. N. } W. P. M. N. N. W. 11 } P. M. N. W. by N. } strong gales,	° ' 19 18	° ' 86 23	29.19	..	..	Black Pagoda to False Point.
	Panthea,	Gale N. Eastward from } midnight. P. M. veered } to Westward. Mid- } night blowing hard at } West, .. .. .. }	.. ..	.. ..	....	..	..	Not far from Augustus.
	Jno. Wm. Dare,	2 A. M. heavy squalls S. } W. P. M. wind W. N. } W., hove to again, .. }	.. ..	.. ..	29.10 falling 28.80 midnight 28.70 to 28.56 29.41	..	..	{ 10 A. M. Bore up, crew being worn { out and ship leaky. P. M. hove to again.
	Algerine,	From 29th May steady } increasing gale S. S. } W. to S. W. by W... }	15 25	87 58	..	..	..	Suspicious weather, much lightning.
	Ariel,	Strong gales S. S. W. .. }	14 37	89 18	..	85	..	{ P. M. Strong gale about S. S. W. to { Midnight.
	Barque Norfolk,	S. W. wind & heavy swell } throughout. Noon } squally, brisk gale. ... }	14 35	89 25	..	..	..
	Brig Arethusa, ..	Strong gales S. S. W. } to W. S. W. through- } out, }	13 49	84 5	..	..	..

Eastern Coast of the Bay and to Dacca.

Chittagong, ....	....	....	22 10	91 51	9 A. M. 30.20*	68.26	28.84
In Combermere Bay & Kyook Phyoo,	Weather oppressive, sky overcast. Bar. unsteady,	....	20 0	90 58	.. ..	..	..

* This Bar. stands about two-tenths below the standard in Calcutta.

Date.	Name of Place or Ship.	Winds and Weather.	Lat. N.	Long. E.	Bar.	Simp.	Ther.	REMARKS.
1st June. 1842.	At Burrisal, ..	Heavy rain with squalls from S. E. Veering to East in the evening & blowing hard all night.	° ' 22 44	° ' 90 20	.. ..	..	..	Not much rain.

Western Coast of the Bay to Kedgerree.

AT MADRAS, ..	.. .. ..	° ' 13 3	° ' 80 16 E	8 A. M. 29.728 4 P. M. 29.626 10 P. M. 29.674	88.5 96.3 92.2			
Poondy Roads, ..	Strong W. N. W. breezes,	19 35	85 3					
At Pooree, ..	Wind from the North; cloudy, rain and lighting,	19 48	85 45	.. ..	79 to 83			
At Cuttack, ..	Rain and calm throughout,	20 31	86 4					
At Balasore, ..	N. E. to N. W., heavy rain and clouds throughout,	21 31	87 11	9 A. M. 29.40 3 P. M. .37 5 P. M. .36	82 83 82½			Wind N. E. to ½ past 5 P. M. when veering to N. W., heavy clouds nearly stationary to the N. W.

H. C. Pilot and Light Vessels

Date.	Vessel's Name.	Winds and Weather.	Station.	Bar.	REMARKS.
1st June, 1842.	H. C. P. V. Coleroon,	Strong breeze E. S. E. to } E. N. E., squally with rain and heavy sea, ..	At anchor 7 fathoms, Floating Light E. by S. ..	29.53 4 P.M. 29.50	Saugor P. V. S. W. 4 S.
	H. C. P. V. Megna,	Fresh gales from the East- ward. P. M. from N. E. }	At anchor, 100 fathoms cable out, ..	Bar. of 3 Ships, 29.60 29.18 29.80	
	H. C. P. V. Cavery,	1 to 2 A. M. nearly a hur- ricane, sea rising high and lightning to the southward. Daylight to noon more moderate, though still hard gale from N. to N. N. W. and N. W., high sea, squalls and dirty appearance. Noon hard gale N. W., heavy showers and sea. P. M. N. W. W., N. W. and West, moderating and veering to W. S. W. and S. W. 8 P. M. hard squalls at West. 8 P. M. to midnight blowing hard at S. W. and S. W. b. W. with thunder and lightning to the S. E., but moderating on the whole, ..	Standing to the S. S. W. and N. N. E. under close reefs, ..	..	A. M. noon to 8 A. M. a little moderated, set topsails. Even- ing much moderated. Heavy sea throughout.
	H. C. P. V. Saugor,	Daylight every appear- ance of fine weather ! middle and latter inces- sant heavy squalls, with rain,	At anchor as before,	..	{ Daylight hove to in 85 fa- thoms. P. M. veered away to 120 fathoms again.

Date.	Vessel's Name.	Winds and Weather.	Station.		Barometer.	Simp.	Ther.	REMARKS.
1st June.	H. C. L. V. Hope,...	From East to E. S. E. blowing hard, about noon moderating. P. M. strong Easterly breezes. 8 P. M. E. N. E. and unsettled,	° / ° 21 26	88 07	8 A. M. 29.33 Noon 29.30 P. M. 29.26	..	..	{ At 11-30 A. M. hove to in 105 fathoms, bad weather, still unsettled.
	H. C. L. V. Beacon,	1 to 4 A. M. East to E. S. E. strong. 8. A. M. abating at East, with occasional squalls. Noon moderate to 8 A. M. Midnight strong Easterly winds,	21 04 N.	88 27	..	..	..	{ Unsettled throughout, sunset fresh at E. N. E. and dark dismal weather.
	At Hidgellee,	.. Cloudy and heavy showers from East all day, .. .	Lat.	Long.	..	29.40	85	
	At Kedgerree,	.. N. E. more moderate, ..	21 55	88 16	..	29.30	..	
From Kedgerree to Calcutta and Inland.								
	CALCUTTA,	.. E. N. E. and variable and squally, ..	22 34	88 22	S. G. 29.381	..	88.3	
	At Chandernagore, ..	Fresh N. E. hot, ..	22 53	88 20	29.59 to 29.49	..	84 to 82	{ Every appearance of the approach of the rains.
	At Munglepore, ..	Easterly winds, ..	23 32	87 15	..	..	..	{ Heavy white scud and dark blue sky.

Date and Time.	Name of Place or Ship.	Winds and Weather.	Lat.	Long	Bar.	Ther.	Ship.	REMARKS.
Noon. 2d June.	Barque Augustus,	6 A. M. N. W. Noon, W. b N. 1 P. M. West. 7 W. S. W. Midnight S. W. strong gales throughout,	° / 19 40	° / 86 16	29 24	..	..	{ Between Black Pagoda and False Point.
	Panthea,	W. S. W. A. M. to S. W. P. M. moderate, .... .	° / ..	..	..	..	..	5 30 P. M. Gaujam W. N. W.
	Jno. Wm. Dare,	W. N. W. fresh gales. P. M. the same, .... .	° / ..	..	Noon 29.0 Midn. 29.0	..	..	Current (or drift) 3 miles per hour.
	Brig Algerine, ..	Gale increased, hove to, heavy rain and furious squalls from W. S. W. to N. W., N. N. W. and North,	° / 17 20	87 6	28.45 to 28.18	..	..	{ 9 A. M. a cross sea S. W., N. W. and N. E., most from S. W. Mid- night more moderate. Barometer 28.30.
	Ariel,	Strong gales West to S. S. W. Noon moderating,	° / 15 03	89 02	29.38	84	..	{ P. M. strong gales about S. W., but less sea.
	Barque Norfolk,	Brisk gales S. W. & cldy,	15 10	88 40				
	Brig Arethusa, ..	Wind S. W. strong gales,	14 22	83 21				
	At Chittagong, ..	Cloudy. Wind A. M. S. E. P. M. West to South,	° / 22 10	91 51	9 A. M. 20.21	82 4	28.80	
	At Barrisal,	Gale from the East and drizzling rain to mid- night,	° / 22 44	90 20				
	Combermere Bay,	Heavy squall, N. W. wind,	20 0	90 58	..	..	..	{ Tremendous sea, blowing heavy from W. and W. S. W. all night.

Western Coast of the Bay to Kedgerree.

Date.	Name of Place or Ship.	Winds and Weather.	Lat. N.	Long. E.	Barometer.	Simp.	Ther.	REMARKS.
21 June. 1842.	AT MADRAS,	.. .. ..	.. ..	.. ..	8 P. M. 29.708 4 P. M. 29.610 10 P. M. 29.672	.. .. ..	90 1 94 3 91 2	
	In Poondy Roads, ..	Strong W. N. W. breezes, ..	19 35	.. ..			
	At Pooree, ..	Wind North to N. W., { cloudy and rain, .. }	19 48	85 45	..	..	78 to 83	Rain.
	At Cuttack, ..	Rain and calm throughout,	20 31	86 4				
	At Balasore, ..	N. W. heavy rain and gusts, low flying clouds throughout, }	21 31	87 11	9 A. M. 29.33 .28 .27	..	82 82½ 81	{ Rather more Westerly, in the evening low flying clouds to the N. E.

Date.	Vessel's Name.	Winds and Weather.	Station.	Bar.	Ther.	REMARKS.
2d June. 1842.	H. C. P. V. Coleroon,	Blowing a heavy gale of wind from E. N. E. to Northward and Westward, hard squalls, rain and heavy sea. . . .	{ To 2 A. M. at anchor as before. Parted and stood to the S. E., lying to underforetopmast staysail. . . . }	{ 7.30 8.30 10.45 11.45 2.49 5.30 7.0 8.0 A.M. P.M. }	{ 29.40 29.32 29.16 29.10 29.0 28.94 29.0 29.0 }	{ 2 A. M. parted, 10 30 heavy gale from E. N. E. Noon wind shifted to North. 2 P. M. wind shifted to N. W. 5 30 wind shifted to W. N. W. Midnight heavy gale at W. S. W. }
	H. C. P. V. Megna,	N. E. to East, fresh gales, heavy squalls and rain, and threatening. P. M. the same. . . .	{ At anchor at Kedgeree. . . . }	{ . . . }	{ . . . }	{ Noon wind settled at N. E. Sunset North blowing hard and thick rain. 9 A. M. hard gale steady at North; 100 fathoms of cable out. }
	H. P. V. Cavery, . .	A. M. today light blowing strong at S. W. by W. and W. S. W. with squalls and lightning. Daylight moderate W. S. W. and clearing up. 7 A. M. blowing strong in hard squalls at S. W. Noon blowing hard at S. S. W. P. M. steady at S. W. Evening decreasing, and sea going down. 10, a severe N. W. Wester. 10 30 light at N. N. W. Midnight N. W. squally and raining, lightning to the Northward, Eastward and Westward.	{ Noon soundings 50 fms. Standing in to 32 fms. black sand. P. M. No observation at noon. . . . }	{ . . . }	{ . . . }	{ Noon searunning very high. P. M. going down. Midnight single reefed topsails. }
	H. C. P. V. Saugor,	Wind N. E. during the day gradually veered round to the N. W. and increased towards midnight to a perfect hurricane from N. W. with heavy thunder, lightning and rain. . . .	{ At anchor. 4 P. M. parted; ran 21 E. S. E. per Log and hove to at 8 P. M. }	{ 28.65 }	{ . . . }	{ 10 A. M. veered to 250 fathoms of cable, but at 4 P. M. parted, hove to, Midnight lost main-topsail, fore topmast staysail, and jibboom. }

Date.	Vessel's Name.	Winds and Weather.	Station.	Barometer.	Simp.	Ther.	REMARKS.
2d June. 1842.	H. C. L. V. Hope, Beacon,	A. M. gale at E. N. E. 4 E. N. E. to E. S. E. heavy gale. 8 East to E. S. E. 5 P. M. East. Midnight E. to E. N. E. and N. N. E. ..	....	{ 8 A. M. 29.26 Noon, 29.11 4 P. M. 29.05 8 P. M. 28.93 }	.... .... .... ....	81° 84 84 84	{ Heavy, squalls &c. throughout. Riding with 240 fathoms of cable.
	H. C. L. V. Beacon,	A. M. to 8 A. M. increasing at N. E. Noon blowing hard at N. E. 4 P. M. heavy gales at N. E. 8 P. M. very heavy gale at N. N. E. Midnight a perfect hurri- cane at N. N. E. veering to the Northward, .. ..	....	{ P. M. 29.68 Noon. 29.60 P. M. 29.68* }	.... .... ....	.... .... ....	{ Heavy squalls and rain throughout, with dismal weather.
	At Hidgellee, ..	....	....	....	29.25	82	{ Cloudy and strong breezes E. and N. E.
	At Kedgerree, ..	N. by E. strong gales, threa- tening weather with heavy rain, .... ..	....	29.15			
<i>Kedgerree to Calcutta and Inland.</i>							
	Steamer Forbes,	In the day N. E., blowing strong with squalls. Sun- set N. N. E. Midnight North... ..	Diamond Har- bour to Mud Point.	....	..	..	{ Sky very variable and threatening at times.
	Barque Fairlie,	7 P. M. North, Midnight strong gales, cloudy and thick rain,	Hooghly Point.	..	..	..	{ Sky very variable and threatening at times.

* This difference in the Barometers I have remarked upon.

Date and Time.	Name of Place or Ship.	Winds and Weather.	Lat.	Long.	Barometer.	Simp.	Ther.	REMARKS.
2d June. 1842.	At CALCUTTA,...	Gale from N. E. by N. } Noon moderating. P. } m. and increasing again } by midnight. }	0 ' ..	0 ' ..	S. G. 29.305 H.P. 29.350 Midnt. 29.170	..	81.2	{ P. M. from 2 to 7 decreasing to puffs and calms. From 10 to mid- night increasing, but Bar. always falling.
	Chandernagore,	N. East to East, bad wea- ther in squalls and calms. 11 A.M. increas- ing, .. .. }	..	..	29.394 Noon 29.294	..	80	Rain at times.
	At Kisenuggur,	Light rain and cloudy. } P.M. increasing breeze } from due East, }						
	At Berhampore,	A squall from N. W. P. } M. fine, }						
	At Jungypore, ..	4 P. M. squall and slight } gale N. N. E. }	24 28	88 08				
	At Soorajunge Factory, ..	Appearances of bad } weather, }	24 26	89 42	..	..	..	{ Squally, large heavy clouds sur- rounding the horizon.
	At Dinagopore,	5 P. M. heavy showers } S. E. to E. S. E., ... }	25 07	89 40				
	At Bancoorah. ..	A. M. wind East to 4 P. M. } North blowing hard to } midnight, }	23 14	87 10	..	..	..	Squalls and rain throughout.
	At Munglepore,	Strong N. E. wind and } in puffs, .. .. }	..	..	..	..	..	At night freshening.
	At Monghyr.....	Calms and very oppres- } sive throughout, .. }	25 23	86 38				
	At Sooree. ..	Easterly light showers, ..	23 54	87 32	..	..	..	On 1st bright sunshiny day.

In the Bay of Bengal.

Date and Time.	Name of Place or Ship.	Winds and Weather.	Lat.	Long.	Bar.	Ther.	Simp.	REMARKS.
3d June, 1842.	Barque Augustus,	S. W. to W. S. W., { latterly fine.}	0 1	0 1	29.30	..	..	Off False Point.
	Panthea,	Fine weather.	20 8	.. ..	....	..	..
	Jno. Wm. Date,	7 A. M. S. S. W. P. M. { fresh gales S. W. and { cloudy. ....	.. ..	.. ..	....	..	..	Weather more moderate. On the 4th lat. 19° 12' long. 90° 33' S. E. Bar. 29.10, wind S. S. W. and monsoon weather.
	Brig Algerine, ..	Steady gale S. W. by W.	19 10	86 42	....	..	..	At 11 P. M. Bar. again 28.20 in a squall from N. W.
	Ariel,	Strong gales S. W.	16 21	87 29	29.31	89½	..	Running to N. W., 5 knots.
	Brig Arethusa, ..	A strong monsoon S S. { W. to S. W.}	14 26	82 53	....	..	..

Eastern Coast of the Bay to Dacca.

At Chittagong, ..	A. M. wind S. Easterly { and strong. P. M. S. { Westerly.}	22 10	91 51	9 A. M. 30.20	80	28.76	{ At 8 30 P. M. a very violent squall from S. W. with much rain.
At Noacolly, ..	.. ..	22 48	91 08	.. ..	..	..	{ At night began to blow from the Eastward and increasing to midnight.
At Burrisal, ..	At 2 30 A. M. E. S. E. { blowing fearfully, to- wards evening abating { at about South. ....}	.. ..	.. ..	.. ..	..	..	{ Narrowly escaping an inundation at this station. Gale during the whole night.
At Dacca, ..	Heavy rain. Wind East, { not very strong. ....}	.. ..	.. ..	.. ..	80 10 A. M.	..	Cool weather.

Date.	Name of Place or Ship.	Winds and Weather.	Lat. N.	Long.	Barometer.	Simp.	Ther.	REMARKS.
3d June. 1842.	AT MADRAS, ..	.. ..	.. ..	.. ..	8 A.M. 29.718 4 P. M. 616 10 P. M. 676	88 6 96 7 88 3		
	In Poondy Roads,	Strong W. N. W. breezes,	19 35					
	At Pooree, ..	Wind from N. W. to S. W. Night calm. A. M. S. W.	19 48	85 45	.. ..	..	84 to 87	Rain 0.10
	At Cuttack, ..	Rain and calm throughout. At night a squall from Southward.	20 31	86 4				
	At Balasore, ..	A.M. N. E. to N. W. heavy rain and gusts. Noon N. W. to 5 P. M. 10 P. M. S. W. stray gusts. ..	21 31	87 11	1 A. M. 29.25 3 A. M. 25 5 P. M. 23	..	81½ 81¼ 82	{ A double reefed topsail breeze with rain throughout. At 8 A.M. N. E. to N. W. Noon N. W. 2 P. M. W. N. W. veering to West, { and at 10 P. M. S. W.

Date.	Vessel's Name.	Winds and Weather.	Station.	Barometer.	REMARKS.
3d June. 1842.	H. C. P. V. Coleroon,	Heavy gale in first and middle parts from W. S. W. latter moderating from S. W.....	Lying to at noon. Lat. obs. 19° 54' N. ..	$\left\{ \begin{array}{l} 8 \text{ 29.32} \\ 10 \text{ 29.40} \\ 12 \text{ 29.42} \end{array} \right\}$ A.M. $\left\{ \begin{array}{l} 2 \text{ 29.42} \\ 4 \text{ 29.42} \end{array} \right\}$ P.M.	$\left\{ \begin{array}{l} 8 \text{ A. M. heavy gale from W. S. W. 3 30 P. M. gale shifting to S. W. and moderating. Night moderate from S. W. b. W. and heavy rain.} \end{array} \right\}$
	H. C. P. V. Megna,	Gale from W. S. W. to S. W. latterly West to W. S. W.	Kedgerree at anchor.	....	$\left\{ \begin{array}{l} 6 \text{ A. M. shifting to the Westward. 8 A. M. N. N. W. 10 A. M. N. W. Noon, heavy gale at West. 3 P. M. S. W. to S. S. W. at its highest pitch and continued blowing hard from the South for three days after.} \end{array} \right\}$
	H. C. S. Cauvery, ..	1 A. M. hard squalls N. W. to W. N. W. and W. S. W. 2 A. M. to daylight moderate at W. S. W. and S. W. Daylight to noon moderate at S. W. and fine weather. Noon light S. W. and fine clear weather. P. M. moderate and fresh S. W. and S. S. W. & fine.	A. M. running along the Coast to the N. of Ganjam from 1½ to 2 miles. Course N. N. E. P. M. hove to in 45 fathoms soft mud, suppose off Jaggernath. ....	....	$\left\{ \begin{array}{l} \text{Daylight saw the southern part of Ganjam hills, bearing W. N. W. in 36 fathoms. Sunset Northern part of Ganjam hills N. N. W.} \end{array} \right\}$
	H. C. P. V. Saugor,	Gradually drawing round about 2 30 A. M. to W. & S. W. with unabated violence. From 4 A. M. to 4 P. M. gradually abating from a hurricane to a strong S. W. wind, with rain at intervals.	Hove to under bare poles. Afternoon made sail. ....	....	$\left\{ \begin{array}{l} 3 \text{ A. M. foresail blew away. Afternoon gradually made sail and stood in to the Westward.} \end{array} \right\}$

Date.	Vessel's Name.	Winds and Weather.	Station.	Barometer.	Simp.	Ther.	REMARKS.
3d June. 1842.	H. C. L. V. Hope, ..	A. M. hurricane at N. N. E. to North and N. N. E. 8 A. M. the same N. W. to W. N. W. Noon decreasing a little W. S. W. 8 P. M. decreasing at W. S. W. To midnight the same, but wild and threatening. Midnight to 4 A. M. very heavy gale N. N. E. veering to North. 8 A. M. perfect hurricane at N. N. W. veering to N. W. Noon no alteration, but veering to West and W. by S. 4 P. M. veering to W. S. W. 8 P. M. moderating W. S. W. Midnight still moderating. ... Cloudy and constant strong breezes from N. and N. W. veering to S. W. at 4 P. M.	Parted. At daylight anchored in 30 fms.	8 A. M. 28.96 Noon 29.10 8 P. M. 29.18	..	..	{ 2 A. M. parted. Daylight brought up with 160 fms. in 30 fms. soft blue mud.
	H. C. L. V. Beacon,		Station.	A. M. 29.72 Noon 29.72 P. M. 29.71	..	..	{ Weather still unsettled at midnight.
	At Hidgellee,		.. ..	.. ..	29.05	82	
	At Kedgerree,	4 A. M. N. N. W. 8 A. M. N. W. Noon West. 4 P. M. W. S. W. 6 P. M. S. W. and moderating, .. ..	.. ..	.. ..	28.73	..	{ Hardest part of the gale from noon to 4 P. M. Heav. gales till evening.
<i>Kedgerree to Calcutta and Inland.</i>							
	Steamer Forbes,	2 A. M. severe squall and increasing from North. 10 N. N. W. Noon N. W. 2 P. M. W. N. W. 4 P. M. West. 6 W. S. W. moderating a little. 8 S. W. 10 to midnight S. W.	Mud Point. .. ..	.. ..	..	..	{ Heaviest squall at 4 P. M. but blowing excessively hard throughout. P. M. rain increasing. Midnight, monsoon gale.

Date.	Name of Ship or Station.	Winds and Weather.	Lat. N.	Long. E.	Bar.	Ther.	REMARKS.
3d June. 1812.	Barque Fairlie, ..	A. M. hard gales North. 3 A. M. N. W. 2 P. M. West. Midnight S. W. ..	} ..	.. ..	2 P. M. 28.30		{ At Hooghly Point riding with 100 and 50 fathoms on two anchors. Hardest of the gale at 2 P. M.
<i>At Calcutta and Inland.</i>							
	At CALCUTTA,	Gales from N. E. by N. & N. by E. increasing to hurricane from 10 A. M. to 1 P. M. At 1 45 calm, and by 6, hurricane again from S. W. till 9 or 10, decreasing to heavy gale at midnight.	} 22 34	88 22	{ Noon SG. 28.64 Lowest 28.278 H. P. 28.625 Lowest 28.275	81 2	{ Lowest depression of the Bar. lasted about half an hour.
	At Midnapore,	At daylight wind from N. E. heavy squalls in rapid succession and heavy rain. Noon lulling to 2 and 3 P. M. when it increased again from the West to a gale all night, veering to N. W.	} 22 25	87 25	.. ..	78	Rain 6½ inches.
	At Chandernagore,	Gale from N. E. to N. N. E. Noon N. E.	.. ..	.. ..	28.791 5 to 6 28.34	..	{ Heaviest of the storm from ½ past 5 to ¼ past 6, when blowing tremendously from N. E.
	At Chinsurah,	N. E. tremendous gale at 9 A. M. P. M. North, veering to East. 5 P. M. most furious. ....	} ..	.. ..	.. ..	78	
	Banks of the Jumna,	A. M. strong Easterly winds increasing to a hurricane. ..	} 24 47	88 52	.. ..	
	At Kissennggur, ..	N. E. to East, with thick drizzling rain.	.. ..	.. ..	.. ..	..	Accounts differing a little.
	At Plassey,	P. M. Tremendous gale from N. E. and increasing, ..	} ..	.. ..	.. ..	..	Bar. nearly down to 29.0.
	At Berhampore, ..	At 7 A. M. increasing to a gale from N. E. to midnight when very heavy.	} ..	.. ..	.. ..	..	{ Veering (apparently) more to Eastward.

Date and Time.	Name of Place	Winds and Weather.	Lat.	Long.	Bar.	Simp.	Ther.	REMARKS.
1842. 3d June.	At Jungpore Factory,	Slight squalls and rain with puffs from N. N. E. { 9 P. M. heavy gale { N. N. E. }	24 28	88 08	.. ..	..	..	Gale all night, with heavy rain.
	At Dinagepore, ..	Cloudy. Evening appearance of gale. 10 gale commenced from N. E. { 2 A. M. Gale commenced from the Eastward and increasing. }	25 07	89 40	.. ..	..	..	{ Increasing throughout the night from { N. E. { Torrens of rain.
	At Soorajegunge, ..	6 A. M. Wind South, threatening weather. 4 P. M. to midnight North. }	24 26	89 42	.. ..	..	..	{ Dreadful heat, threatening from the { South, a few drops of rain.
	At Bhaugulpore* ..	W. N. W. heavy gusts. 5 P. M. S. West; to midnight the same. .. }	25 10	87 4	.. ..	..	..	{
	At Bancoorah, ..	Strong N. E. Wind and scud with rain, increasing and drawing Northerly. }	23 14	87 10	.. ..	..	..	Gale and rain all night.
	At Munglepore, ..	2 A. M. N. W., veering to N. E., heavy burst and rain. }	23 28	87 12	.. ..	..	..	Continuing to midnight.
	At Sooree,	A. M. Overcast. 5 P. M. rain at night, high wind from N. E. }	25 23	86 36	.. ..	..	..	Incessant rain all night.
	At Purulia,	Gale commenced at N. E. { at 4 A. M. drawing gradually to N. 4 P. M. N. N. W. at 6 & N. W. at midnight. }	23 54	87 32	.. ..	..	..	{ Unsettled weather and gloomy on 1st { and 2d, when fresh from East with rain.

* Properly from Kunjirpore Factory, a few miles E. by N. from it.

† Corrected to level of Calcutta, see Table.

Eastern Coast of the Bay and to Dacca.

Date and Time.	Name of Place or Ship.	Winds and Weather.	Lat.	Long.	Barometer.	Ther.	Simp.	REMARKS.
1842. 4th June.	At Chittagong,	A. M. Stormy, Southerly, P. } M. South & S. Westerly. }	22 10	91 51	9 A. M. 30.202	79	28 82	{ At night, after blowing hard from S. W. a heavy squall from N. W. 2.968 inches of rain in 24 hours.
	At Noacolly, .....	....	..	..	....	..	..	{ Wind veering to-day from E. and E. b. S. to S. E. Half a gale.
	At Burrisal,	Wind South, very high.....	..	..	....	..	..	{ Tremendous gusts during the night.
	At Dacca,	Wind S. E. and S. S. E. } very strong in gusts. .... }	..	..	....	83	..	{ Continued rain and heavy squalls.

Western Coast of the Bay to Kedgeeree.

AT MADRAS, ....	....	....	....	....	8 A. M. 29.736	82 6	
					4 P. M. 638	96 7	
					10 P. M. 626	88 3	
At Pooree,	S. W. Cloudy. P. M. squall } from N. W. .... }	....	....	....	....	82 to 90	Rain 0.05
At Balasore,	S. W. inclining at times to } Southward, clearing up. }	....	....	..	....	....	Rain and passing showers.

H. C. Pilot and Light Vessels.

Date.	Vessel's Name.	Winds and Weather.	Station.	Bar.	REMARKS.
842. 4th June.	H. C. P. V. Coleroon,	Strong breeze from S. W. moderating to fine weather.	Noon running in W. N. W. under foresail and close reefed topsails. P. M. cruizing off Point Palmyras.	8 M. 29.50 Noon 29.54 8 A. M. 29.56	{ 2 A. M. heavy squalls S. W. 4 A. M. made sail and stood in W. N. W. 6, water discoloured, no ground 40 fms. to noon 1 P. M. 35 fms. blue sand 3 P. M. 22 fms. red sand, 4 25 fms. dark sand, 15 1/2 miles per Log, since noon. 8 P. M. in 23 fms. off Point Palmyras. A barque on shore on the Mizzen. Symmetry missing.
	H. C. P. V. Megna, ..	West to W. S. W. more moderate.	At anchor Kedgeree.	.. ..	{ 7 30 Juggernath bearing N. N. W. 10 Black Pagoda N. by E. 1/2 E.
	H. C. P. V. Cauvery,	Fine monsoon breezes from S. S. W. to S. W.	A. M. Off the southern part of Conjong Bay. P. M. at anchor in 14 fathoms black mud and sand. False Point Light N. W. 1/2 N. .. ..	.. ..	{ Found we had run in 55 miles by Log since noon yesterday to the W. N. W.
	H. C. P. V. Saugor,	Strong breezes from S. S. W. to S. W. and fine weather.	Standing in; at noon on the Ridge 32 fms.	.. ..

Date.	Vessel's Name.	Winds and Weather.	Station.	Barometer.	Simp.	Ther.	REMARKS.
1842. 4th June.	H. C. L. V. Hope, ..	Gale at S. W. throughout with heavy sea, rain and threatening appearance.	Station.	8 A. M. 29.25 Noon. 29.28 8 P. M. 29.31	.... .... ....	84° 84 85	{ Riding with 220 fathoms, cable out.
	H. C. L. V. Beacon,	The same. ....	....	A. M. 29.71 Noon. 29.71 P. M. 29.72	.... .... ....	
	At Hidgellee,	Showery and clearing up. { Wind S. W.	Lat. Long.	....	29.35	80	
	At Kedgerce,	S. W. Strong breezes and moderating. ....	....	29.0			
<i>Kedgerce to Calcutta and Inland.</i>							
	Barque Fairlie,	A. M. S. Westerly heavy gales, moderating at 6 A. M. }	Hooghly Point.				
	At CALCUTTA,	Gale from S. W. decreasing till 10 A. M. when calm & squalls till midnight. }	° ' ° ' 22 34 8422 S. G.	29.193	81.6	....	{ Barometer gradually rising to the 11th.
	At Midnapore,	Wind S. W. blowing strong.	....		....	....	{ Latterly Monsoon weather and winds.
	At Chandernagore, ..	P. M. N. N. E. to S. W. 4 A. M. S. W. in squalls increas- ing, but moderating at 10, }	....	29.194	....	....	{ Scud from Southward to Northward.
	At Chinsurah,	Gale abated. Veering a little to the North from the East with lulls }	....	....	....	80	Soft rain.
	Banks of the Jumna, P. M. ..	from the East with lulls	24 47 88 52	....	....	....	Torrents of rain.

Date and Time.	Name of Place or Ship.	Winds and Weather.	Lat.	Long.	Bar.	Simp.	Ther.	REMARKS.
1842. 4th June.	At Kissenuggur,	.. South to S. S. W. .. ..	.. ..	.. ..	.. ..	.. ..	.. ..	{ Accounts very imperfect; at the height of the gale, wind South.
	At Plassey, ..	6. P.M. gale continuing, wind from S. E. .. ..	.. ..	.. ..	.. ..	.. ..	.. ..	Eastward.
	At Bethampore, ..	Blowing heavily the whole day, East or a little North of East. .. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	At Jungypore, ..	N. N. E. heavy gale to 7 P. M. when veered to East, blowing furiously all night.	24 28	88 08	.. ..	.. ..	.. ..
	At Soorajegunge Factory, ..	Wind shifting from E. to E. S. E.	24 26	89 42	.. ..	.. ..	.. ..	{ Blowing with the same violence as on the 3rd.
	At Dinagepore, ..	Gale continued without abatement, N. E. and E. N. E.	25 07	89 40	.. ..	.. ..	.. ..	Not abating during the night.
	At Titalayah, ..	A. M. blowing almost a hurricane from S. E. for about 2 hours. Rain, thunder and lightning.	26 28	88 25	.. ..	.. ..	.. ..	{ From 1st to 4th gloomy weather, with rain and squalls from N. W. Much thunder and lightning.
	At Poorneah, ..	7 A. M. gale commencing in strong squalls from N. E., with sleet. P.M. increasing.	25 45	87 23	.. ..	.. ..	.. ..	{ Wind moderating in short intervals. Weather murky and oppressive on previous days.
	At Bhaugulpore, ..	A. M. N. E. drizzling rain. 10 E. N. E. Noon N. E. blowing hard. 2 P. M. E. N. E. Midnight E. N. E. gale at its height.	25 10	87 04	.. ..	.. ..	81	Rain blowing into mist by the force of the wind.
	At Bancoorah, ..	Blowing tremendously, thick small rain. About S. W. throughout.	23 14	87 10 E.	.. ..	.. ..	.. ..
	At Munglepore, ..	Strong Northy gales, incessant rain veering to the Westward.	23 23	87 12 E.	.. ..	.. ..	.. ..	{ Westerly gales and rain all night.

Date.	Name of Place.	Winds and Weather.	Lat. N.	Long. E.	Bar.	Simp.	Ther.	REMARKS.
1842. 4th June.	At Monghyr, ...	From West to N. E. and S. E.	25 23	86 38	..	..	..	{ Torrents of rain. Wind continually veering.
	At Sooree,	Strong wind N. E., during the night changed. {	23 54	87 32	..	..	..	{ Incessant rain, change about mid- night.
	At Purulia,	N. W. gale throughout.	23 20	86 24	29 636	..	79	

Eastern Coast of the Bay and Dacca.

Date.	Name of Place.	Winds and Weather.	Lat. N.	Long. E.	Barometer.	Simp.	Ther.	REMARKS.
1842. 5th June.	At Dacca,	.. South and more moderate; 3 30 P. M. wind changed } to S. W. in a violent } squall and back to S. E.	.. ..	.. ..	.. ..	.. ..	84°	Stormy night and heavy rain.

Western Coast of the Bay to Kedgeeree.

AT MADRAS.....	.. ..	.. ..	.. ..	.. ..	8 A. M. 29.506	.. ..	90 0	
					4 P. M. 29.322		90 8	
					10 P. M. 29.364		88 1	
Pooree,	N. W. to S. W. 4 P. M. } strong, .. ..	.. ..	.. ..	.. ..	.. ..	.. ..	83 to 87	Rain 0.30.

H. C. Pilot and Light Vessels.

Date.	Names of Place Ship.	Winds and Weather.	Station.	Barometer.	Simp.	Ther.	REMARKS.
1842. 5th June.	H. C. P. V. Hope,	Blowing hard at S. W. through- out.	Station.	8 A. M. 29.36 Noon 29.41 8 P. M. 29.41	.. .. ..	84° 85 85	
	H. C. L. V. Beacon,	The same. .. .. .	..	A. M. 29.71 Noon 29.71 P. M. 29.71			
	At Hidgelee, ..	Squally and heavy showers from S. W. .. .. .	..	.. .. .	29.55	80½	
	At Kedgerree, ..	S. W. moderate, but dull and hazy. .. .. .	..	29.20			
	At Midnapore, ..	S. W. Monsoon weather. .. .. .	..			
	At Chinsurah, ..	S. W. Monsoon. .. .. .	..			
	Banks of the Jum- na,	Wind veering about from East to S. E. and South, blowing tremendously. ....	..	.. .. .	..	..	Torrents of rain. On 6th Monsoon gale, S. W.
	About Kisenug- gur,	At 3 or 4 P. M. 5 blowing hard S. S. W. South, & Midnight S. E.	..	.. .. .	..	..	Accounts very imperfect.
	At Berhampore, ..	To 8 A. M. from the Eastward. P. M. from S. W. .. .. .	..	.. .. .	..	..	Time of change or veering not given.
	At Jungypore, ..	6 A. M. wind veered to S. E. 1 P. M. S. S. E.	o / o / 24.28 88.08	.. .. .	..	..
	At Dinagapore, ..	Gale moderating, wind draw- ing to the Southward of East and declining.	25.07 89.40				

Date.	Name of Place.	Winds and Weather.	Lat. N.	Long. E.	Bar.	Simp.	Ther.	REMARKS.
5th June.	At Purneah,	A. M. gale continuing from N. E. P. M. veering a little to the Eastward.	° 25	' 45	° 87	' 23	..	
	At Soorajegunge Factory,	8 A. M. shift of wind from E. S. E. to S. W. after a short calms.	24	26	89	42	..	{ Blowing almost a hurricane throughout.
	At Bhaugulpore,	To 5 or 6 A. M. Wind as at midnight E. N. E., heavy gale. 10, wind North blowing hard. Noon N. W. decreasing, 4. W. N. W. 6 West.	25	10	87	04	..	{ Blowing strong, and heavy rain to midnight.
	At Bancoorah,	S. W. gale decreasing P. M. and drawing to the South.	23	14	87	10	..	
	At Munglepore,	Wind S. W. & moderating. Noon Westerly gale again. P. M. S. W. ....	..	..	..	..	..	{ Hard rain or heavy showers throughout. Clearing up in the evening, with a heavy thunder storm.
	At Munghyr,	West to N. E. and S. E.	26	23	86	38	..	{ Torrents of rain, wind continually veering.
	At Sooree,	2 A. M. West, wind shifted to N. W. 5 P. M. moderating to midnight.	23	54	87	32	..	{ Incessant rain, height of the gale from 4 to 7 A. M.
	At Purulia,	8 A. M. W. N. W. Noon West. 2 P. M. W. S. W. 8 P. M. to midnight S. W.	23	20	86	24	..	Moderating from midnight.
					29.621	..	77	

Date.	Name of Place.	Winds and Weather.	Lat.	Long.	Bar.	Simp.	Ther.	REMARKS.
6th June.	At Kissennaggur, ..	Gale ending at N. N. W. ....	...	....	....	..	..	{ Blowing furiously for an hour only from N. N. W.
	At Jungypore,	Wind veered to S. S. W. } gale abating. Noon sub- } dued gusts from West. .. }	24 28	88 08				
	At Soorajegunge,	Noon abating a little. 5 P. M. } shifted from S. W. to W. }	24 26	89 42	....	..	..	{ Storm had subsided to light breeze at 5 P. M.
	At Purneah,	Gale continuing till 5 or 6 } P. M. when abating. ... }	25 45	87 23	....	..	..	{ 7 A. M. on 7th a strong N. Wester for about an hour and a half with a deluge of rain.
	At Bhaugulpore,	West, drizzling rain light } winds. 6 P. M. fine. }	25 10	87 04				
	At Bancoorah,	South, heavy rain.	23 14	87 10	....	..	..	Monsoon weather.
	At Munglepore.	Southerly, fair all day.						
	At Sooree,	Calm.	23 54	87 32				
	At Purulia,	5 A. M. S. W. to P. M. South.	23 20	86 24	29.596	..	79	Moderate and gentle breeze.

SUMMARY AND RESULTS.

I shall now endeavour to deduce from the evidence afforded by the foregoing documents and tables:—

1. The origin and track of the Storm.
 2. Its circular (or other) motion.
 3. Its rate of travelling.
 4. Other phenomena.
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I. II.—*The Origin and Track of the Storm, with its circular motion, will be best considered together.*

If we look in our table of the 20th instant, at the logs of the *Algerine* and *Ariel*, p. 977 and 978, we shall find that in the S. E. part of the Bay, or between latitude 10° and 14° N. and longitude 90° and $92\frac{1}{2}^{\circ}$ E* over a space of 290 miles, the distance of the two vessels apart, some atmospheric disturbance was apparently taking place, and over a considerable extent. This was continued on the following days, but seems to have been nothing more, at least with them, than the setting in of the monsoon; for on the 31st May, the *Ariel*, *Algerine*, and *Norfolk* were all, as will be seen, about in the middle of the Bay, and within a circle of 100 miles in diameter, with variable winds and squally weather from North to N. W., West, and S. W. The *Arethusa* four degrees further to the Westward had a strong monsoon. Up to the 1st June, indeed, these ships had nothing but a strong monsoon. It was *not* then with them that the storm began, and the only trace we find of it in the Bay, beyond the Sand Heads, is with the *John William Dare*, which vessel being bound to Penang, got as far as about latitude 17° N., and about on the line from the Light Vessel to Cape Negrais, on her route from the Sand Heads, but was obliged to put back on the 1st June. She had a smart N. Easterly breeze in latitude $17^{\circ} 56'$ and longitude *about* $93^{\circ} 30'$, or about 250 miles S. E. by S. from the Light Vessel at the Sand Heads, on the 30th May; and running to the Southward and Eastward with this breeze it became a S. Easterly, S. S. Easterly, and eventu-

* I use round numbers here; the tracks of the two vessels are given upon the Chart.

ally a Southerly gale on the 31st, with a heavy cross sea ; her Barometer falling from 29.50 on the 30th to 29.30 on the 31st, when she hove to. If this was the beginning of the rotatory storm, which I have called the *Cauvery's* storm, (see Chart,) as it may well have been, this change of wind is exactly what should have occurred, and the fall of the Barometer and heavy cross sea confirm the probability, that it was the North Eastern part of the vortex which she met with. The *Norfolk*, which was four degrees to the W. by S. of the *John William Dare*, had also threatening weather, with wind from the N. N. W. becoming N. W., as she ran to the Southward, she being on the S. W. quadrant of the storm, if there was one. At the Sand Heads and False Point, we find by the logs of the Pilot Vessels, that the winds and weather were gloomy, squally, and threatening a gale from the Eastward, with their Barometers falling (*Coleroon* and *Beacon's*), while to the Southward we find the *Algerine* and *Ariel* with heavy weather (or the monsoon ?) from the W. S. W. and S. S. W. This state of winds and weather all over the Bay is also, it will be noted, that which we might suppose to occur at the first part of a rotatory motion occasioned perhaps by a struggle between the N. East and S. W. monsoon, which last, as we see by the log of the *John Craig*, was apparently blowing strongly up from latitude 6° N. We cannot assign any place for the centre of the storm, but if there was one, it was doubtless between the position of the *John William Dare*, Point Negrais, and the *Norfolk*.

31st May.—It was at noon blowing half a gale from N. E. by N. to N., increasing to a gale from N. N. W., and to a hurricane at midnight, with the H. C. P. V. *Cauvery*, which stood to sea from her station off False Point and to the S. E. of it, off Conjong Bay,* where she hove to. With the Light Vessels also a gale had set in from E. to E. N. E., though at Kedgerree, the weather was only threatening, and at Calcutta there was nothing remarkable, as to the wind and weather, to common observers ; though the Barometer had fallen from the average of 29.64. to 29.50.

The ship *Augustus* had the commencement of this storm, (which as felt most strongly by the False Point station vessel, we may call the

* In the Charts, *Codgone* Bay.

Cauvery's storm,) from the N. E., but it must have been of small extent, for it did not reach the *Panthea*, which vessel was about 90 miles due West of the *Augustus* at noon; and hence we may also deduce, that the Easterly gale felt by the outer Light Vessel was also not truly a part of it, but probably the combined effect of the Monsoon, the disturbed weather felt in the middle of the bay by the *John William Dare* and *Norfolk*, &c., and of the outskirts of this small vortex I have placed the centre of the *Cauvery's* storm in latitude $18^{\circ} 20' N.$ longitude $87^{\circ} 53' E.$; but it may have been farther to the Southward, for no log was kept of her run to sea, nor of her drift when hove to. It was the 3d before she got back to sight the land off Ganjam.

1st June.—From midnight the *Cauvery* was still drifting to the South, with a hurricane from North to N. N. W., which veered by noon (as the centre passed to the Northward of her position,) to the N. W. to W. at 8 P. M. and S. W. at midnight. This storm may have exhausted itself before it reached the shore, though the *Panthea* felt the N. E. gale of its N. W. quadrant; but we have unfortunately no account from Ganjam or Pondy, about, or to the South of which places it would have reached the shore if its centre landed upon the coast. At Pooree it was only felt as heavy rain on the 31st.

The *Augustus* on this day had the wind veering from the E. by N. to N. W. by N., confirming the evidence derived from the *Cauvery's* log, of its having really been a small storm. I have therefore marked a small circle for it, with the *Cauvery's* place at noon upon the Chart.

We may thus fairly allow that this was a separate storm of small extent, preceding that of which the centre passed over Calcutta, by about 62 hours. Whether it also was the one which appears to have been originating with the *John William Dare*, on the 30th of May, or whether her storm of that date gave rise to both this and the Calcutta storm, we do not know. I am inclined to *think*, that the *J. W. Dare's* storm *was* the *Cauvery's* hurricane, because if its track had been more Northerly, it would have brought the centre closer to the *John William Dare*, than she seems to have had it. We have, however, no right to conclude, that a rotatory storm does not at any part of its progress separate into two or more storms, since (see Capt. Tapley's report, 3rd Memoir, Journal of the Asiatic Society, Vol. X.

p. 1,011,) they certainly *include* whirlwinds which are separate from, although included in the main body of the storm, and our Calcutta storm certainly separated into others on subsequent days.

1st June.—We have no data on this day from which we could with any degree of probability assign any fixed centre for our Calcutta storm of the 3rd, and indeed I am of opinion, that it was only now forming itself,* in the Northern part of the Bay.

For we find that at Chittagong and Noacolly, they had no signs of a gale, Barometrical or of other kinds. At Burrisal, they had, it is true, heavy rain and squalls from S. E. veering to E. in the evening and blowing, hard all night; but this may scarcely be considered, I think, as more than an indication of the *commencement* of an atmospheric disturbance at least till midnight; and as I have before remarked, we must allow of a commencement somewhere. A part of this S. Easterly gale and rain may indeed have been owing to the *Cauvery's* hurricane which was now, at midnight, as just described, at its height; but then we find that it certainly did not reach to the Northward and Eastward so far as the Floating Light, *Saugor* and *Coleroon*, all three of which had moderate weather (the *Saugor* even at daylight “every appearance of fine weather;”) this must wholly preclude our considering this Burrisal commencement as any part of the *Cauvery's* hurricane.

2d June.—We find, first as to the ships in the middle of the Bay, from 15° to 17° 20' N. (*Norfolk*, *Ariel*, and *Algerine*,) they had, as has occurred before, a heavy monsoon blowing across the Bay, the swell of which seems also now just to have reached the Arracan Coast, produc-

* I have before remarked, that these storms must begin *somewhere*. I may add here, that they must also begin *somehow* and *somewhen*, i. e. we must find (or allow) for their commencement, place, cause, and time,—if we can. We may suppose that when a rotatory storm forms, it begins at the centre increasing outwardly—or at the circumference—or in parts of either? and these parts may be even at different distances from the central space, and that, when the *rota* is formed by one set of forces, another may begin to operate to move it onwards, and that its first progress may be slow while the vortex is spreading? We may also suppose, since, we *know* nothing on the subject, that the same force which produces the rotation, produces also the progression? One of the first effects of the strong rotation and progression must be to draw in other currents of air, or to throw them outwardly, and to influence those already existing, that is to say, it may draw in by its progressive motion while it throws others out by its rotatory (centrifugal) force?

ing the heavy swell and N. W. squall, described there in Captain Brown and Dr. Hinton's reports.

Farther northward in the Bay, we find the *John William Dare*, (which vessel had done all she could to get to the N. W., since she bore up on the 1st in about latitude 18° North,) with her Barometer falling to 29.00, and a strong W. N. W. gale; but she does not appear to have been within the true circle of the storm, which hereabouts and at this time was only perhaps slightly influencing the true S. W. monsoon by its Southern quadrants. We have thus no data in the middle of the northern part of the Bay, nor on its Eastern shores; and on its Western side from 15° to $17\frac{1}{2}^{\circ}$ N., and towards the meridian of False Point we have nothing in the logs of the *Ariel*, *Algerine*, and *Norfolk*, but a strong or heavy monsoon. We must thus infer that the Calcutta storm commences, for us, with the log of the *Beacon*, the outer Light Vessel at noon, where with her and at Calcutta there was a gale at N. E.,* and that it was of small extent, and yet very irregular, (perhaps still forming?) for though the *Beacon* had a steady gale at N. E., the *Hope* Light Vessel, 25 miles to the N. N. W. of her, seems to have had it very variable and Easterly, and at Kedgerree and on the river it was mostly between North and N. N. E. throughout the day, settling at N. E. at noon at Kedgerree. To seaward, the *Cauvery* off False Point, and the *Augustus* and *Panthea* off the Black Pagoda and Ganjam, had the storm of the 1st moderating and running into the monsoon from S. W. and S. S. W. to West. The *Cauvery* was at this time (noon) about the same distance to the S. W. or S. S. W. of the *Beacon*, that Calcutta is to the North of her station, and the centre of the storm to give the *Beacon* the wind at N. E., must have been about on the latitude of False Point, which would have given the *Cauvery* a Northerly (N. by E. to N. N. W.) wind, and not one from the S. W., which she now had. We find indeed that it was nearly midnight when she had winds from the N. W., that is when the *Cauvery's* hurricane had sufficiently left her to allow the Calcutta one to be felt, though it was now very severe with the *Coleroon*, which vessel was obliged to run out, and almost met the centre coming up, as the rapid change from E. N. E. to W. S. W., or 16 points in the 24 hours, or less time

* Which moderated in the evening at Calcutta, but increased again towards midnight.

fully shews. At Kedgerree also by sunset, the gale was N., "blowing hard," and at 9 p. m. a hard gale, steady at N.

The *Coleroon's* log will give us the nearest approximation to the place of the centre of the Calcutta storm at noon this-day. This vessel, lying at anchor close to the *Beacon*, parted at 2 a. m., and stood to sea to the S. E. with the wind at E. N. E. heaving to probably, about 30 miles to the S. E. of the *Beacon*, where she had the wind at North at noon, and the *Beacon* had it at N. E. This would give about an E. by N. or E. N. E. wind at Calcutta, but as the gale there moderated greatly from noon towards evening, we may suppose its true circumference to have scarcely reached that city at this time, or at most, that this was but the exterior of it, as at False Point, which place is about as far to the West of this spot as Calcutta is to the North of it. To seaward, i. e. to the S. Eastward and Southward also, the circumference cannot fairly be said to extend to the radius which it would require (140 miles) to include Calcutta. At Burrisal, to the N. N. E. of this centre, they had an Easterly gale with rain, which is what should occur on the N. E. quadrant of these storms, with moreover the effect of the deflected S. W. monsoon from the Aracan coast which must be allowed for.

The point, thus, for the centre of the Calcutta storm at noon on the 2d June, may not unfairly be taken as in latitude $20^{\circ} 30' N.$, longitude $82^{\circ} 20' E.$; and as the centre passed over Calcutta at, say 2-30 p. m. on the following day, and the distance between these two spots is 140 miles, this will give 140 miles in $26\frac{1}{2}$ hours, or a rate of 5.3 miles per hour for the track of the storm upon a N. N. W. course,* taking it to have followed a strait line; and measuring back on this line, the distance travelled over from noon to 2h. 30m. p. m., we have the point which I have marked, $12\frac{1}{2}$ miles S. S. E. of Calcutta, for the place of the centre on the 3d June at noon.

It will be noticed by the table, that just at the time of the gale and shift of wind at Calcutta on the 3rd, the same phenomenon took place at Midnapore, which is 70 miles to the W. b. S. This requires a separate consideration. The first supposition is, that the calm space of the storm *might* be as much as 70 miles in breadth (?) but this con-

* My newspaper estimate says, about a NWbW. course. This was judged of by the shift of wind, as well, as that could be ascertained, in the middle of a town.

tradicted in too many ways for us to admit it. For, first, if we say that the storm was moving at the rate we have estimated, 5.3 miles per hour, and that the calm lasted at Calcutta, at the most from 1h. 30m. P. M. to 3h. 30m. P. M., or two hours, this would give, say, 11 miles for the diameter of the calm space; and that it was not more, is corroborated by the fact, that, to the southward, the Barque *Fairlie*, at Hooghly Point, 25 miles to the S. Westward of Calcutta, and at the towns of Chandernagore and Chinsurah, 17 and 20 miles to the northward, no mention* is made of any calm interval; so that our estimate of 11 miles for the utmost breadth of the centre is not far wrong. Again, to the Southward of Hooghly Point, to Kedgerree and Saugor, which are about the same distance from Calcutta, in that direction, that Midnapore is to the W. b S., no calm took place. We are thus obliged to allow, that at Midnapore, there was a separate vortex of small extent, for it appears by Mr. Homfray's report, that it was not felt along the valley of the Subunreeka, which he says, averages about 40 miles to the Southward of that stations.†

And this fact again precludes our considering it as any relic of the *Cauvery's* storm just described, even if the interval of time, and the want of any trace inland of this storm, did not also wholly make this supposition improbable. The interval of time is from the 31st at midnight, when the *Cauvery*, then about 100 miles to the S. S. E. of *False Point*, had a hurricane at North, the centre of it being not far to the Eastward of her, to about 2 P. M. on the 3d, or 62 hours; and the distance from the estimated place of the centre to Midnapore, would not be more than 240 miles. Midnapore also bears about North a little Westerly from this supposed centre. To have reached that station, the storm must have travelled about on a North course up between the Light and Pilot Vessels and Balasore, and passed close to Kedgerree. Not only there is no trace of this at Kedgerree, but the veering of the wind, from North to a hurricane at N. N. W. and ending at West, *must* have been that of a storm travelling from the S. E.

* Mr. Earle, in his excellent account of the storm at Garden Reach, see p. 996, mentions no calm; but that, from a hurricane at about N. b. W. it became "blowing pretty fresh at N. W." before it again blew a hurricane from S. W. and W.S.W. He was only 4 or 5 miles from Government House.

† Speaking no doubt of the road distance. I find that by Mr. Tassin's map it averages about 30 only.

We have thus shewn, that the Midnapore vortex was *not* the Calcutta one, and that it was *not* the *Cauvery's* storm. We must therefore consider it as a separate one, and generated in the neighbourhood; in other words, as an independent eddy from our greater one, for though heavy, no great mischief was done.

We must now, in endeavouring to ascertain the track of the storm between the 3rd and 4th June, consider, that at noon on the 3d, (giving it, as I have done on the Chart, only a radius of 90 miles, or a diameter of 180) its N. Western and Western quadrants, were then impinging against the range of low hills which form the outliers and parallel ranges of the Vindyha range* called to the North Eastward, (or those to the South of Bhaugulpore on our Chart,) the Curruckpore, further South the Pachete, and to the South of the Subunreeka river the Balasore hills. We do not know the height of these, but some of them may not be much short of 1500 or 1800 feet, the station of Purulia being, by Barometrical admeasurement, 670 feet above Calcutta: perhaps we may take 1000 feet as an average height, and W. N. W. as the average direction of the longest vallies? These ranges are separated, as will be seen, by the valleys through which the feeders of the Soobunreeka, Roopnarain, and Dummooda rivers find their way, and must, doubtless, with the transverse ridges and valleys, cause much disturbance, and consequent irregularity, to a storm. It is certain, that buildings and groves of trees do so to the small whirlwinds, and from strict analogy we may assume, that 500 or 1000 feet of hills or ascents, with breaks and intervals amongst them, may do the same with larger ones.

If thus, as above said, we take a radius of 90 miles, and strike with it a circle of 180 miles in diameter on an accurate Chart,† we shall find as below :—

At	The wind <i>should be</i>	By reports the wind <i>was</i> , by estimate about
Calcutta,.....	N. N. E.....	N. E. by N.
Beacon Light Vessel,....	W. $\frac{1}{2}$ N.....	West.
Kedgerree,.... .	N. W. $\frac{1}{2}$ W... .	due West.

* This is the bending of the Vindyha chain to the South, to join the Coromandel range, as sketched on my map in the First Memoir, Journal of the Asiatic Society, vol. 8, p. 636, and also on the Chart to the present Memoir.

† My Chart is not quite accurate. The tangents in the first column are laid down from Commander Lloyd's Survey of 1840.

At	The wind <i>should be</i>	By reports the wind <i>was</i> , by estimate about
Mud Point, E.N.E. 9 miles from Kedgerree,	N. W. by W.	N. W.
At sea, to the S. E. of the Light Vessel (Log of the <i>Coleroon</i>),	S. W.	S. W.
Balasore,	N. W. by N.	N. W.
Burrisal,	S. by E.	about S. S. E.*
Kissennagur,	East.	N. E. to East.

I have not included here such places as Berhampore, &c., because they are on the verge of the circle or out of it, and at Bancoorah we have the anomaly of the wind at W. N. W., with that already noticed in the Midnapore vortex. It will be seen that the rest of the tangents agree well enough† to form a circle of, say 180 miles in diameter.

Towards the stations situated not far from the first rising of the spurs of the Sub-Himalaya, as Dinagepore and Poornea, we find that on this day the gale commenced at the most Easterly of these two, Dinagepore, which is about on the meridian of Calcutta, but 153 miles to the North of it, at 10 P. M.; but at Titalayah which is really on the ascent, and 81 miles further North, nothing was felt on this day, or on the succeeding.

We have now to consider the course of the storm from noon of the 3rd to noon of the 4th. We find that by noon of the 4th, it had quitted Calcutta entirely, and that it was

At Chandernagore, Variable N. N. E. to S. W.
,, Chinsurah, Abating.

Both these places being then towards the verge of our supposed circle, and in its retreating S. E. quarter.

* The report says, "E. S. E. at 2-30 A. M. veering to South, and moderating in the evening. Now this may be called veering 6 points in 16 hours, and as from 2-30 A. M. to noon there are 9½ hours, this would give 3¼ points of veering to noon, or from E. S. E. to S. S. E. ½ E. We do not know that it *did* veer at equal rates, in equal times, and probably did not."

† I say here, "well enough" adverting to the difficulties which, as I have pointed out in former memoirs, always exist in determining what was the true direction of the wind; how that direction was influenced at the surface of the earth by local causes; and finally, the great probability that the wind at the circumference is often not a tangent, but a spiral curve. This I have endeavoured to shew on the diagrams and in the title, and Midnapore circles.—See also Col. Reids and Mr. Redfield's works.

- At Kissennuggur, S. to S. S. W.
 „ Plassey, gale from S. E.
 „ Sooree, strong wind . . . N. E. changing to W. at night.
 „ Berhampore, E. or a little to the N. of it.
 „ Mungulpore, } Northerly gales, veering to the
 Westward.

These are also accurate enough for a part of the circle of the Calcutta storm, but it will be seen, there was evidently also at this time one, if not two other smaller vortices, one to the West and the other to the East of the main, or centre, or Calcutta one; for the wind was also at this time, noon of the 4th,

At Bancoorah, blowing tremendously from . . about S. W.

„ Purulia, N. W. gale throughout.

To the Eastward we have:—

At Dacca, very strong in gusts, S. E. to S. S. E.

At Soorajegunge, shifting from East to E. S. E.

Banks of the Juboona, veering a little to Northward of East, with lulls,—which also shew that the vortex, which on the following day certainly passed over Soorajegunge factory at 8 A. M., was now forming, or *had* formed, and was travelling up, as I have marked it on the diagram. At Dinagepore we find the gale continuing, and at Purneah, farther to the Westward, it is marked as commencing in strong squalls from the N. E.

On the 5th, we have, as before stated, a vortex passing over Soorajegunge factory at 8 A. M., the effects of both this and of the Jungypore storm being felt at the factory on the banks of the Juboona. At Bhaugulpore we have also the wind veering so rapidly from E. N. E. in the morning to West in the evening, as to shew that a vortex was passing close to the Eastward of that place; and at Berhampore, and Rungpore there are also indications of the passage of a third. We shall take these in the order I have named them. We have then for the Soorajegunge storm,—

At Soorajegunge, . . . At 8 A. M. shift of wind from E. S. E. to S. W.

„ Banks of Juboona, { 65 miles to the West by N.; wind veering
 about from East to S. E. and South.

„ Dinagepore, Declining at S. E.

„ Dacca, South, S. W., and S. E. with squalls.

It will be seen by the diagram that these tangents (or parts of spirals) form part of a circular storm, which we must observe was evidently checked to the Eastward (see Comillah report,) by the Cachar hills, and disturbed by, and mixed up to the Westward with the other vortices, and perhaps to the Southward and South Westward with the S. W. monsoon, which at the Sandheads, and probably from thence over to Chittagong, had now fairly set in, as it had at this last station.

About and at Bhaugulpore, (my report being from a factory within a few miles of the station. I have used this name, as that of a well known spot easily found,) we have the wind as follows:—

Bhaugulpore.—From midnight E. N. E. heavy gale at its height ; at 10 A. M. North ; noon N. W. ; and at 6 P. M. West.

At Monghyr, we have for the 4th and 5th, just such phænomena as might be expected from the confused action which would arise at the junction of two circular storms. On both days, it is described as veering from West to S. E. and N. E., with torrents of rain. At Surajgurrah factory, 40 miles to the WbS. of Monghyr, we find the wind to have been blowing almost constantly "*from the Northward*," which we may take to be any point, or all the points, between N. W. and N. E. ; and at Purneah, which is 40 miles to the N.N.E. of Bhaugulpore, and not far from whence the winds would be deflected by the hills, we find it was a continued gale from N. E., but veering a little to the Eastward in the evening. To the W. and N. W. (Tirhoot and Ghazeepore,) the storm did not reach ; but at Lucknow the Barometer between the 28th May and the 6th June, was affected 0.2 of an inch. We should also bear in mind, that this Bhaugulpore storm, if it was that of Calcutta, had to force its way over the Curruckpore hills, the range which forms the Southern barrier of the valley of the Ganges as far as Rajmahl, so that the irregularities may have arisen also from various streams of air pouring through the different defiles, as they could find a passage.*

The third vortex seems to have been a small one to the West of Jungypore, where on this day we have the wind which had been on the 4th a heavy gale at N. N. E., veering to East and blowing furiously all night, on the 5th veered at 6 A. M. to S. E., and by 1 P. M. to S. S. E. ; though at Berhampore, only 5 miles to the S. by E. of it, the wind was S. W. in the afternoon, having changed to that point from

* See Note at p. 1089.

8 A. M. in the morning, when it was Easterly. If we say even ESE. and that it changed by the South, as it must have done, this was a veering of 10 points in 6 or 8 hours at most; and at Jungypore it was not much less, being, say, from S. E. at 6 A. M., to S. S. E. at 1 P. M., or 10 points in 7 hours. It is true that, as shewn by the arrows, the N. N. E. gale of the 4th at Jungypore might be allowed for as an anomaly arising out of the double effect of the Calcutta and Soorajgunge vortices, with perhaps other local causes with which we are unacquainted; but then we find that this rapid veering was taking place just at the time that the same took place at Bhaugulpore, which is 100 miles to the N. W. of Jungypore, and as before stated, separated from it by the Curruckpore hills. There must then have necessarily been two vortices, and I have so marked them.

We have only for the 6th, the different gales abating in the quarters they should do if they arose from the passage of a circular storm, and farther to the South and South Westward, calms or light monsoon weather, which does not call for any remark, and we may consider that on this day, all direct traces of the storms as circular ones cease. The secondary effect of this great atmospheric disturbance over most of the Bengal provinces were, it will be seen, felt as far as Almora; and the Barometer was probably more or less affected all over India, though unfortunately we have only good observations at Calcutta, Madras, Bombay, Poona, Lucknow, Purulia and Dadoopore, and none for the N. E. angle (Assam.) For the Eastern frontier, from Cachar to Tenasserim, where observations would have been very interesting, we have only those of Chittagong and Akyab.

III.—*The rate of Travelling.*

That already laid down from the Sand Heads to Calcutta of 5.3 per hour between the 2nd and 3rd is, I think, the only one for which we have any fair grounds of inference; for we cannot afterwards take upon ourselves to say, what influence each vortex might have had upon the other.

IV.—*Other Phænomena.*

The reports from Gya, and from Amooah in Tirhoot, that is to the East and N. E. of the limits of the storm, should not be passed

over without notice, for we may fairly say from them, that though the storm was not felt there at the surface of the earth it was distinctly *seen* over head in the "clouds driving about in all directions and winds very gusty" of the Gya report, and the more express "upper dark masses of clouds whirling about in a most extraordinary manner, but driving towards the N. E." of that from Amooah. From the nature of the ground,—Gya being perhaps at least 800 feet, and Amooah 500 feet above the level of Calcutta,—the storm had already been lifted by the intervening hills, and thus received an upward impulse.* We know of no force to propagate it again downwards, particularly as having discharged so much of its rain, and meeting the warm air of the N. Western Provinces after the dry season, it was probably thereabouts less dense than the lower strata. The whole seems, from Mr. Batten's graphic report from Almora, to have been driven *en masse* against the flanks of the hills to the N. W., producing the thunder storms and the phænomenon described at the intervening stations.

The situation of Gya should also be mentioned with reference to this phænomenon. It lies, as marked on our Chart, in latitude $24^{\circ} 49' N.$, longitude $85^{\circ} 5' E.$, and is thus 125 miles to the W. by S. of Bhaugulpore. Before reaching Gya, however, in a direct line from Calcutta, the range of the Ramghur hills, which bounds the valley of the Damooda on the North side and at Hazareebaugh rises to 1100 feet in height, has to be passed over, after which the ground descends before rising again from the hills, forming the valley of the Sone river, so that we may suppose this part of the storm to have been raised by the Hazareebaugh range, high enough to allow it to pass over Gya. ?*

* The following is an extract from a private letter of Mr. Redfield's to me, relating to this view of the subject:—

"It will not be surprising, if we find that the regular exhibition of the gale or burricane on the surface of the Bay of Bengal, and the adjacent coasts, is more or less disturbed or interfered with by the influence of the wooded countries, and particularly the *high lands* to the East and North of this arm of the sea, over which elevations the wind must pass before it can be felt upon the Bay or the Peninsula. In most other countries this sheltering influence appears to be great, often lifting one side of the gale, or a part thereof, above the surface of the sea; so that this side of the gale is only noticed by its influence on the Barometer, or by the rain which may attend it. Much irregularity also prevails in this and other cases in the *extent* of the quiescent centre of the gale, and in the strength and shifts of the violent winds near to the borders of this centre, and they have been known to shift backward and forward in fitful and irregular changes."

Amooah may be considered as situated at the foot of the *glacis*, which descends from the secondary ranges of the Himalayas, and at a point about which the circular storms from Calcutta upwards, and the *gale* blowing from the Eastward along the foot of the hills may have met, and thus have occasioned the "whirling about" noticed in the report.

The most remarkable of the results of our enquiries is the explanation which is afforded us, by the clear and exact reports from Soorajunge and Bhaugulpore, and by the curious accounts of the whirling and driving about of the clouds at Gya and Amooah of a phenomenon which is often puzzling to account for; that of "winds continually veering," which happens so often in furious tempests, not only at the centre, where it may well be looked for, but also at the *circumference* of storms. It is clear, or at least in the highest degree probable, that this arises from the interference of two storms, the currents of which, perhaps variously affected in their course, meet at certain points, and thus cause the continued veering or vibrating of the wind. In the present memoir, we have in the log of the *Algerine*, at p. 978, an instance of this occurring at sea, which may have been the effect of the monsoon, and on shore at Monghyr, and at the factory on the banks of the Jaboona, at which places, as to the two last, we *know*, that this cause existed.*

I have adverted, p. 1087, to the influence which the Cachar hills, (the ranges to the Eastward of Dacca,) may have had upon the Soorajunge storm, but there is another consideration to be borne in mind here, which is, that both from the effect of the S. W. monsoon, as well as that of the storm, the winds would necessarily become more Southerly along the Eastern limits of the plains, which for our purpose we may take to be marked by the course of the Burrampooter to lat. 26° N., and more Westerly along the foot of the Eastern and Western ranges of the Nepal hills, or parallel to the line of the stations of Rungpore, Dinajepore, and Purneah. We may indeed, from Dacca to Purneah, consider

* Supposing their cause to have operated with less intensity, and in more time as at the circumferences of great circles of 500 or 1000 miles in diameter, we should probably have the same phenomenon, then called "variable winds, with a cross swell for the last 48 hours," which we so frequently meet with in Log books. See also Col. Reid's Chapter V. on Variable Winds.

that the *gales* experienced were *as much* owing to the monsoon as to the local effects of the hurricane. In my first Memoir, I have given a Chart fully explaining how this should occur, and really *did* occur on these same days in 1839, (3rd to 7th June,) at the setting in of the S. W. moonsoon of that year, which I find has been quoted by Professor Dove of Berlin, as exactly tallying with his theory of the causes of these atmospheric disturbances.* The object of our present researches is not so much to trace out the *causes* of storms, as to chronicle exactly the facts and other evidence; but I allude to this as necessary to be held in remembrance by those who may follow me in the attempts which I make to shew the causes of apparent anomalies when they occur.

RESULT.

To those who may not have the time to go through the foregoing details and summary of our evidence, the following brief notes of the RESULTS of our inquiries relative to this remarkable storm may be acceptable. I have endeavoured to distinguish in them clearly the degree of certainty to which I think each separate head is entitled. It appears then that,—

1. From the 28th to the 31st May there seems to have been, in the S. Eastern and Eastern parts of the Bay, some considerable atmospheric disturbance, probably accompanying the setting in of the S. W. monsoon; but as far as we are informed, nothing which could be certainly called a rotatory storm, though it is highly probable that the *John William Dare* experienced on the 30th May the Eastern quadrant of the *Cauvery's* storm noticed in the next paragraph.

2. But on the 31st May, by which time the Barometer at Calcutta, where the weather was fine, had already fallen 0.14 below the average, the H. C. P. Vessel *Cauvery* had a true rotatory gale increasing to a hurricane at midnight of between that day and the next, and moderating at noon of the 1st June. This storm, which I have called

* See Scientific Memoirs by Taylor.

“the *Cauvery's* storm,” veered with her from N. E. by N. to S. W. in about 36 hours, or nearly a point an hour. It was perhaps felt by the Light Vessels to the N. E. and N. of her, and certainly by the *Augustus* and *Panthea* coming up from the South, but was of no great extent. It may possibly have originated with the *John William Dare* on the 30th, about four degrees to the W. S. W. of False Point, but we have no distinct proof of this. It did not reach the shore about Pooree except as heavy rain.

3. The *Cauvery's* storm was moderating at noon on the 1st and to midnight when it had wholly ceased, and it was noon of the 2nd June, before we can say that the Calcutta storm had fairly commenced with the Light Vessels and partly at Calcutta. It was met at sea this day to the S. E. of the Light Vessels by the H. C. P. V. *Coleroon*, which had parted and stood to sea from the outer Light Vessel's station.

4. The Light Vessels' and *Coleroon's* Log fix the place of the centre, (for the Calcutta storm was then on the 2nd a true rotatory one,) very well, as being at noon about 60 miles to the S. E. of the Light Vessel.

5. The passage of the hurricane over Calcutta, fixes the place of its centre for the 3rd at about $12\frac{1}{2}$ miles to the S. S. E. of Calcutta at noon that day. It determines also pretty exactly its line of track from the 2nd at noon to the 3rd, and its rate of travelling at about 128 miles in 24 hours, or 5.3 miles per hour. Its diameter seems to have been about 180 or 190 miles.

6. About the same time that the centre of the Calcutta storm passed that city, the centre of a separate storm passed also over the station of Midnapore, about 70 miles to the W. by S. of Calcutta. This was of small extent, and not violent enough to do any considerable mischief. It seems to have been a sort of eddy storm, occasioned by the combined influences of the False Point storm, and the monsoon and the outer verge of the Calcutta storm.

7. That there were on the 4th two more vortexes or circular storms blowing, the one to the Westward about Bancoorah and Purulia, and the other between Soorajegunge factory and Dacca to the Eastward. The Calcutta storm is still traceable on this day, making in all three distinct rotatory storms, and these storms, with the general Easterly gale caused by the combined effect of the Northern quadrants of the storms, and of the S. W. monsoon deflected from the ranges of hills

on the Eastern frontier along the base of the Himalayas, was felt along the line of the Northern frontier from Dinajepore to Purneah; but not to so great an elevation as Titalayah, which is about 1,000 or 1,200 feet above the level of Calcutta, and 50 miles farther North than Dinajepore.

8. That on the 5th, there were also three distinct revolving storms, one at Soorajegunge, *over* which a centre passed between 8 and 9 A. M., and two others at Bhaugulpore and Jungypore, close to which centres must also have passed. The Bhaugulpore one was *not* that of Calcutta, and that of Jungypore may be supposed to be made up of this last and the influence of the Soorajegunge storm.

9. On the 6th, the storms were all breaking up and moderating.

10. That where the circumferences of the various circles met, and particularly on the 5th, there was a continual "veering about of the wind," though blowing a full storm.

11. That at some places, as Gya and Amooah in Tirhoot, the storm though not *felt* as one at the surface, was distinctly *seen* overhead, driving the clouds about in all directions.

12. That at the line of stations along the base of the Northern hills, the storms felt were not rotatory ones, but *probably* composed of the Northern quadrants of these circular storms to the South, and the great Easterly current formed by the deflection of the S. W. monsoon from the Arracan, Cachar, and Bootan hills, as shewn in my first Memoir for the storm of June, 1839.

13. That the greatest intensity of the various storms was that at Calcutta, for they are no where spoken of, nor are any facts recorded, which would lead us to suppose, that they were at any place the furious hurricane, which during some hours the storm undoubtedly was at Calcutta.

CONCLUSION.

I will not omit here one remark, to which I request the attention, as well of those who have kindly assisted our researches as those who might, but have not done so; and this is, that all will consider how much has here been demonstrated, and inferred from evidence literally collected piecemeal, and of which each separate part would have been comparatively valueless, if not aiding to form the whole. There can

be, I think, no stronger proof than this of the utility of every man's notes and remarks, how little important soever *he* may imagine them to be, and (a notion which I fear yet prevails sufficiently to deter many from assisting us, though well disposed to do so,) *the value of every plain common sense account of the weather, whether within or without the limits of a storm.* I repeat here again, that *all* observations are of value to us; that scientific ones are of course the best, but that the plain ones are often quite as useful at certain points, and that as our science is as yet in its infancy, our main business is to collect and register evidence. It will be observed, and it is a striking proof of what I have just said, that two of the most important deductions we have obtained in this investigation, have been proved by three simple unscientific statements of this kind. Mr. Martin of Soorajunge factory, and Mr. A. Pinard of Kunjirpore factory near Bhaugulpore, with the Newspaper notice from Jungypore, the author of which I do not know. From these we have been enabled fully to establish the highly curious fact, that a violent hurricane, with a strong monsoon setting in at about right angles to its course, sometimes breaks up into several smaller storms, none of them equalling the main one in fury, *but all obeying the law of rotation.* These reports also explain a phænomenon, the cause of which we suspected before, but of which we had no distinct proofs. I mean those instances in which what is usually described both at sea and on shore as "wind continually veering" takes place, though we have full evidence, that the places are at a distance from the centre of the storm, and this again leads us to the strongest confirmation of Col. Reid's theory of the variable winds. I trust it is unnecessary after such instances to repeat, that *all* observations may be of use.

from the 3rd to the 6th June 1812

Note here that of the Chart

References in the Storm Circles

Storms of the 3rd
4th
5th
with

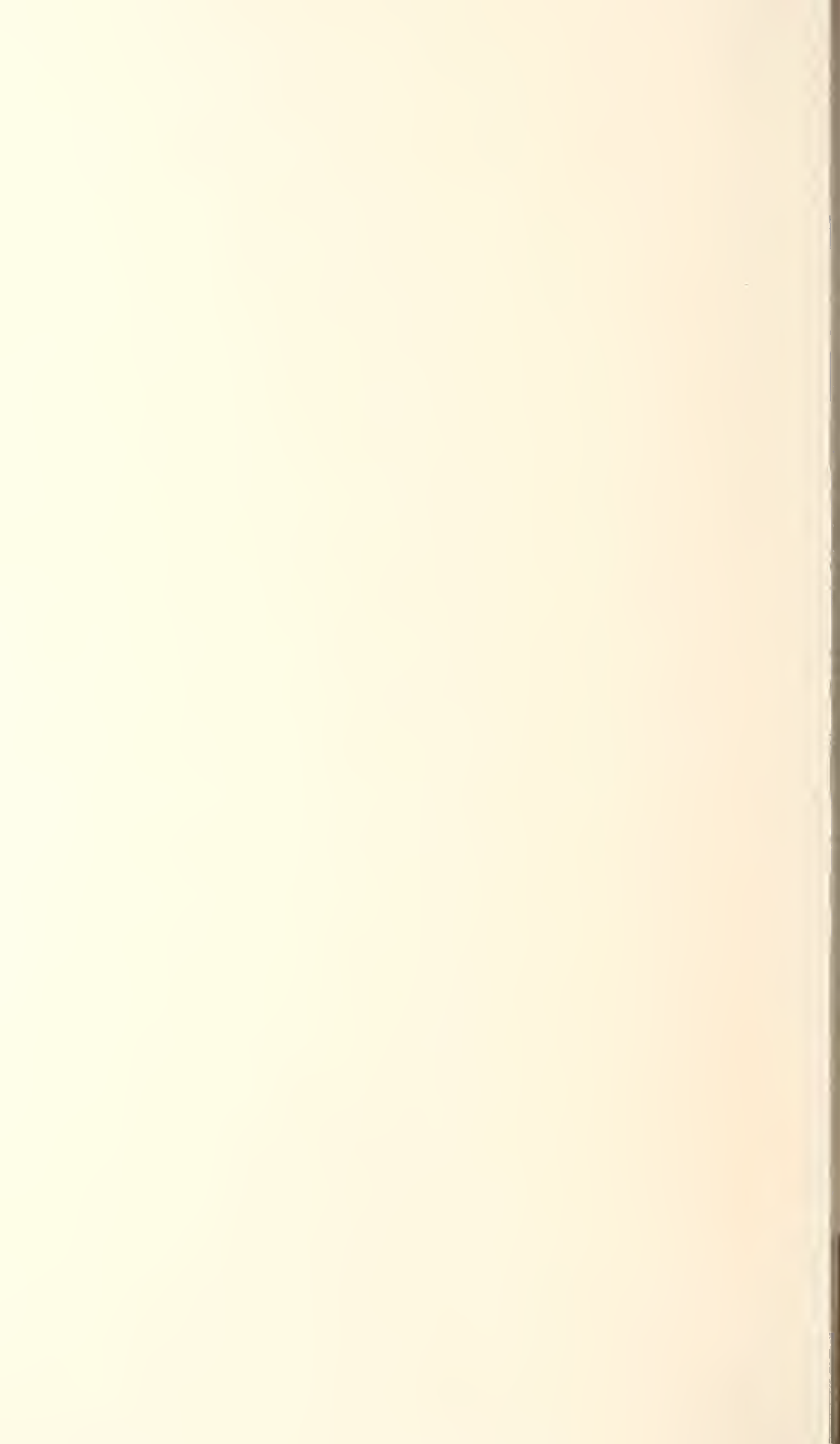
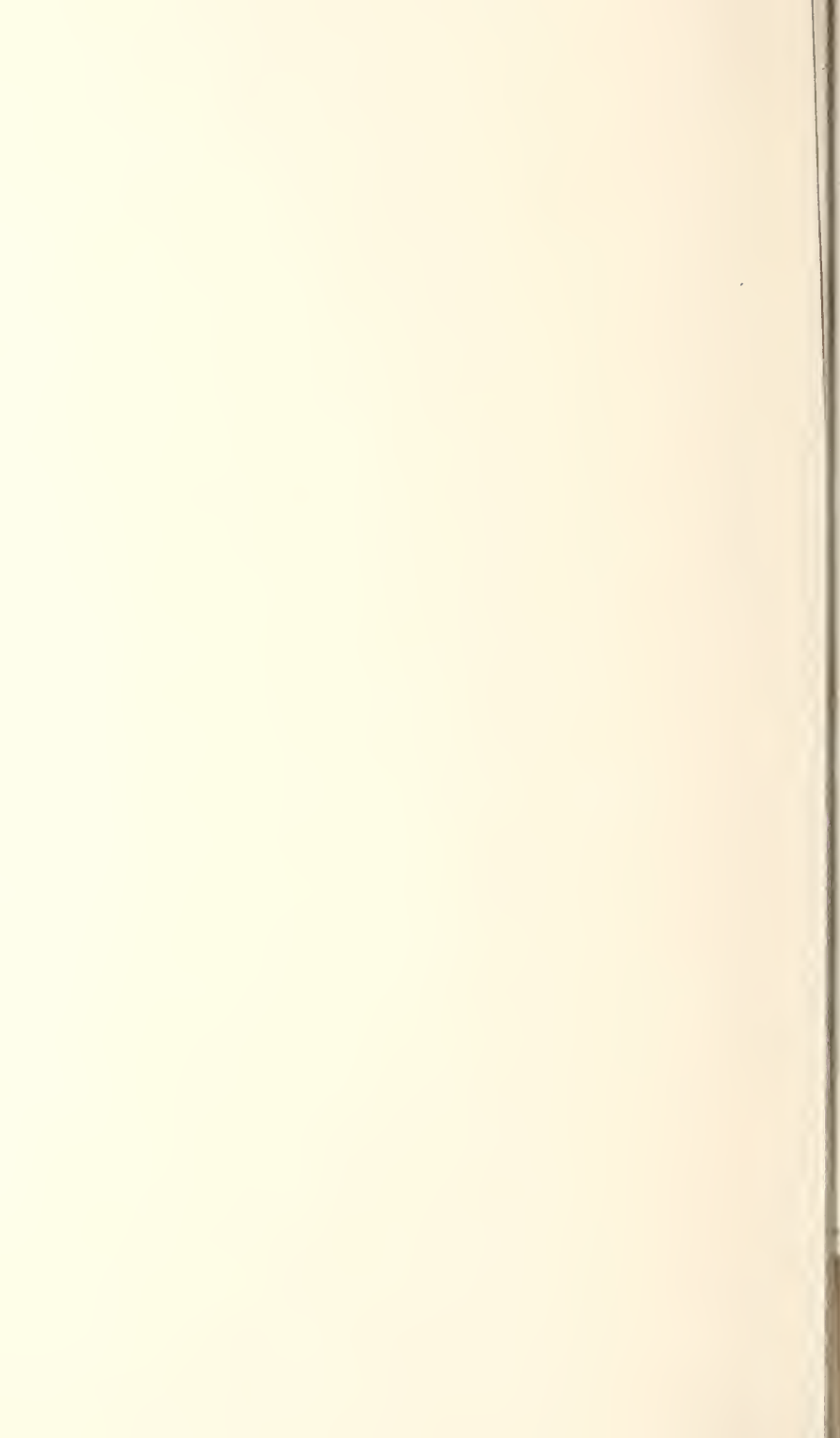




Chart
To the SEVENTH MEMOIR
on the
Law of Storms
IN INDIA
being
The Calcutta Hurricane
of 2nd and 3rd June
1812.
By Henry Piddington

References to the
Storm Circles

- 1st and 2nd Storms of 2nd and 3rd June
- Storms of the 4th
- of the 5th
- of the 6th



A Monograph of the Indian and Malayan species of Cuculidæ, or Birds of the Cuckoo family. By EDWARD BLYTH, Curator of the Asiatic Society.

[Continued from p. 928.]

25. *Ph. longicaudatus*, Nobis, *J. A. S.*, X, 923; perhaps *Ph. Cranfurdii*, Gray, mentioned in Mr. Eyton's catalogue of a collection of Malayan birds, *P. Z. S.*, 1839, p. 105; or it may be the *Melias Diardi* of Lesson, which I have reason to suspect is allied. (LONG-TAILED MALKOHA.) Length of a fine specimen twenty-three inches, of which the middle tail-feathers occupy sixteen inches and three quarters, the outermost ten inches less; wing six inches, the tertiaries overpassing the primaries half an inch more; bill to forehead (through the feathers) nearly an inch and three-eighths, and an inch and a half to gape; tarse nearly an inch and three-eighths. General colour dark greenish-grey; the wings and tail shining dark green, with a white tip to each tail-feather; front of the neck and breast, paler, passing into whitish on the throat and immediately around the naked space encircling the eye, these whitish feathers having dark shafts, which terminate in a slightly prolonged hair-like bristle; small anterior portion of the lores black, and the bare orbital space moderately developed, and papillose. Beak bright green, and legs apparently have been greenish. This bird is common in the Tenasserim provinces, and always seen in pairs. It would appear also to be not rare in Nepal, and from the *M. S.* name *monticolus* applied to it by Mr. Hodgson, may be presumed to affect upland forests. Should it be the *Ph. Cranfurdii* of Mr. Gray, of which I have seen no description, it would also inhabit the Malay peninsula.

26. *Ph. Jerdoni*, Nobis: *Xanclostomus viridirostris*, Jerdon, *Madr. Journ.* XI, 223, — not *Ph. viridirostris*, Eyton, *P. Z. S.* 1839, p. 105, which is the *Rhinortha rufescens* (?) of this Monograph. (FORK-FEATHERED MALKOHA.) Length about fifteen inches, of which the tail is nine inches, its outermost feathers four inches and a quarter less; wing five inches and three-eighths; bill to forehead (through the feathers) an inch and one-eighth, and to gape an inch and a

quarter; tarse an inch and a quarter. "Irides fine blood-red; small naked eye-spot cobalt-blue; bill beautiful apple-green; legs and feet greenish-black." Upper-parts coloured exactly as in the preceding species, but less greyish on the head, which is distinctly though faintly glossed with green, nor is there any whitish towards the nostrils or bordering the contracted naked orbital space above: under-parts dusky-greyish, stained with ferruginous about the breast, and the feathers of the throat and fore-neck dusky at base, and furcate, from having their terminal webs much longer than the shaft, this lengthened portion being pale greyish, contrasting with the rest.

In most particulars this bird agrees with Dr. Latham's description of his *Madagascar Cuckoo*, *Gen. Hist.* III. 270, (the *Serisomus cristatus*, Swainson, or *Coucou huppé de Madagascar* of Buffon,) which Lavaillant states is also found in some parts of India, and in Senegal; Dr. Latham adding, that "I find a similar one among the drawings of Mr. Daniell, found in Ceylon, and there called *Handee Kootah*." No doubt the present species is alluded to in both cases.

Mr. Jerdon informs us that it "is found all over the [Indian] peninsula, but it is an uncommon bird, except in some few localities. I have seen it in thick bamboo jungles at the bottom of the Conoor pass, in thick hedges and trees in the Carnatic, and in bushy jungle in the Deccan. It wanders about from tree to tree, or works its way through the thick hedges, and feeds on various large insects, such as Grasshoppers, *Mantides*, and the like; also on caterpillars and other larvæ. It makes its way with great adroitness through the thick prickly hedges and bushes it delights to frequent."

These are all the Asiatic species of *Malkoha* which I am able to offer any description of, though aware of the existence of others, of which some, perhaps, may be identified with certain of the foregoing. Such are *Ph. Cranfurdii* of Gray, and *Melias Diardi* of Lesson, both of which are not improbably my *longicaudatus*; and Mr. G. R. Gray adds, among his *Phænicophainæ*, a *Calobates radiceus*, Temminck, *Pl. Col.* 538, and a *Taccocua Leschenaultii* of Lesson, one or both of which may be exclusively African, though more probably inhabiting the Malay countries. There is also a *Phænicophæus lucidus*, Vigors, mentioned as an inhabitant of Sumatra in Dr. Horsfield's list, *J. A. S.*, X. 56.

Next in order ranges a remarkable form, which combines the general contour and short and curved inner hind-claw of the preceding, with the beak (and, in at least one instance, the spinous plumage) of the Coucals (*Centropus*). It is the *Zanclostomus* of Mr. Swainson.

27. *Z. Javanicus*: *Phœnicophæus Javanicus*, Horsfield, *Lin. Trans.* XIII, pt. I. p. 178, and figured in the *Zoological Researches in Java*; *Coccyzus rubrirostris*, Drapiez, *Dict. Class. d'Hist. Nat.* IV, 558; *C. chrysogaster*, Temminck, apud Horsfield, "Catalogue of Javanese Birds" prefixed to *Zoological Researches in Java*; *Chalybeate Cuckoo*, Latham, *Gen. Hist.* III, 304, but not the Var. *A.*" appended to this.* (BAY-BREASTED SIRKEER.) "Entire length eighteen inches, nearly eleven of which are occupied by the middle tail-feathers. The upper parts generally are greenish-gray, having a metallic lustre, which is stronger on the upper part of the tail, and on the extremity of the wings, where the tint is saturated inclining to black. The head is of a lighter tint, inclining to plumbeous, and without any lustre; having a small naked mamillary space surrounding the eyes. The base of the bill is surrounded with vibrissæ, straggling, and pointing forward and backward. The cheeks, the throat, the neck anteriorly, the vent, and the thighs, have a ferruginous-chestnut tint, which on the latter is darker, inclining to rufous; the lower part of the breast and the abdomen have the plumbeous colour of the head more diluted, and slightly variegated with chestnut. The bill is red and shining; the naked space about the eyes yellowish, and the feet are black. About half an inch of the extremity of the tail-feathers is tipped with white: and the irides have also a whitish hue.

"This bird is found in the society of different Coucals, at the confines of large forests, in plains covered with low shrubs and solitary trees. It resembles the *Phrenotrix Temia* [*Crypsirina varians*] in its habits and manners. The shortness of its wing permits only of interrupted flights. It is not found in great abundance in Java, being chiefly observed about noon, and it is remarkable for the beauty

* "Length sixteen inches. Bill long, rather bent, and black; plumage above brown; spurious wing white; beneath, with the under wing-coverts, from the breast to the vent, pale rufous; quills and inner webs white, from the base to the middle; tail cuneiform, the two middle feathers four inches long [evidently a mistake], the outer one two inches and a half, all of them tipped with white, and the inner webs barred with the same." Very doubtful as appertaining to the present genus.

of its form." (HORSFIELD.) This species has also been received from Borneo, and from the Malay peninsula; the presumed female differing in having the breast-patch brownish instead of plumbeous.

28. *Z. Calorenychus* (*calorhynchus* ?); *Phænicophæus calorenchus*, Temminck, Col. 347. (RED-HEADED SIRKEER). Thus briefly noticed in Griffith's English edition of Cuvier's *Régne Animal*, VII, 465, and there placed next to the preceding species. "Black; head and neck, red; crown, iron-grey; bill yellow, red, and black"—the admixture of the last perhaps an indication of immaturity. Inhabits Java.

29. *Z. Sirkee*, Jerdon: *Eudynamys* (!) *Sirkee*, Hardwicke and Gray; *Sirkeer Cuckoo*, Latham, *Gen. Hist.* III, 267; *Centropus cuculoides*, C. W. Smith, *J. A. S.*, X, 659, (INDIAN SIRKEER). The only specimen of this I have to describe from is probably a female, rather small in its dimensions, with the buff plumage of the under-parts almost confined to the lower part of the breast. Length about fifteen inches, of which the middle tail-feathers measure nine inches, and the outermost two inches and a half less; wing six inches; bill to forehead (through the feathers) an inch and a quarter, and an inch and a half to gape, its greatest vertical depth seven-sixteenths of an inch; tarse above an inch and a half. General hue of the upper parts ashy-brown, with a gloss of green, the shafts of the feathers dark-coloured and spinous, more especially on the head, neck, and breast: under parts paler, slightly tinged with fulvous on the throat and fore-neck; the lower part of the breast, with the thighs, wholly fulvous or buff; vent and lower tail-coverts dusky glossed with green; the middle pair of tail-feathers coloured like the back, and the rest successively darker and more largely tipped with white: on the tertiaries, upper tail-coverts, and tail-feathers, are numerous cross-rays which appear or not according as the light falls on them: bill coral-red, tipped with yellow, and some black at the lateral margin of the upper mandible. Mr. Jerdon describes the bill of the fresh bird, as "cherry-red yellowish at tip; feet plumbeous; irides reddish-brown. Length sixteen to seventeen inches; wing six inches and a quarter; tail nine inches and a half." The entire under-parts are represented uniform fulvous in Hardwicke and Gray's figure; and the black remaining on the sides of the upper mandible in the specimen before me (presented by Mr. Jerdon) is doubtless a sign of nonage.

Mr. Jerdon remarks having "seen this bird in bushy ground on the top of the Neilghierries, but in no other locality till lately met with in a hilly and low jungly district, near Jaulnah. It has the same wandering habits, and the same kind of food," as the *Phœnicophæus Jerdoni*. Mr. C. W. Smith records having "met with this species at the Bherah lake, in the Gorruckpore district, where it appeared to be pretty common, but I have not," he remarks, "seen it elsewhere. It greatly resembled the *Mahooka (Centropus Phillipensis)* in its manner of running and flying."

There now only remain the Coucals (*Centropus*, Illiger, v. *Corydonyx* Vieillot, v. *Polophilus*, Leach), which are at once distinguished by their long and straight inner hind-claw and rigid spinous plumage, though of one species (*C. affinis*) Dr. Horsfield writes—"unquæ hallucis arcuato," which would seem to intimate its true station to be in the preceding group. The structure of their feet indicates ground-habits, and they are mostly seen walking upon the ground. One species appears to be very common throughout India and the adjacent countries to the east and south.

30. *C. Phillipensis*, Cuvier: *Corydonyx pyrrhopterus*, Vieillot; *Cent. bubutus*, Horsfield, *Lin. Trans.* XIII, pt. 1, p. 180, and *Cuculus bubutus*, Raffles, *Ibid*, pt. II, p. 286; *Chestnut Cuckoo*, Latham, *Gen. Hist.* III, 243, on which is founded *Cent. castanopterus*, Stephens' Shaw's *Zoology*, XIV, 215; *Polophilus Sinensis*? Shaw's *Zoology*, IX, 51. (COMMON INDIAN COUCAL.) Length of a fine male eighteen inches and a half, by twenty-three inches in extent; wing eight inches; and middle tail feathers nine inches, the outermost three inches shorter: bill to forehead (through the feathers) an inch and a half, and tarse two inches, the long hind-claw above an inch. Irides crimson: bill and feet black. This handsome bird has the mantle and wings bright rufous, and the rest of the plumage black glossed with purple and greenish, the latter prevailing on the ear-coverts and tail, and the former elsewhere: its feathers are but slightly spinous, and chiefly so on the crown and fore-neck; sexes alike. The young in first plumage vary remarkably, as illustrated by two specimens with imperfectly developed feathers which I have recently obtained. One is essentially similar to the adult, but the feathers are shorter and of flimsy texture, the colours dull, the black or dusky

fading to brown on the lores and chin, there is no rufous on the middle of the back, and the scapularies, tertiaries, and wing-coverts, are suffused with fuscous; irides pale dusky; this proved a male, and on no part of it is there a single cross-band. A female of the same age accords in size and in the texture of its feathers, but in colouring is widely different; the irides are dull blue, and the bill flesh-coloured, except the upper half of the superior mandible, along its ridge, which is dusky; the other young specimen having the beak almost wholly dusky, except at the lower part of the under mandible at base: general colour of the upper parts black, barred with bright rufous; of the under parts greyish-dusky, barred with white; tail glossy green-black, with narrow white bars: the crown spotted with rufous, paling and merely tipped with rufous on the occiput and neck; and the wings in particular very beautifully barred black and rufous, the latter becoming obsolete on the exposed portion of the tertiaries: lores and above the eye whitish. Another female moulting from this barred dress into the adult livery has such feathers as remain of the former different from those of the last described specimen; its unchanged scapularies being rufous-brown without barings, much duller rufous than the new ones; the primaries, secondaries, and tertiaries, that remain, are barred with lighter dusky than in the other; and the only unchanged tail-feather (one of the middle pair) is crossed with eleven undulating narrow pale fulvescent bars. This specimen had been intermediate in colouring to the two others. In this barred dress it is the *Centropus fasciatus*, C.W. Smith, *J. A. S.* X, 659, and also Dr. Latham's alleged variety of his *Antiguan Cuckoo*, (*Gen. Hist.* III, 247), upon which Shaw has founded his *Polophilus Sinensis*; but while Dr. Latham correctly describes the form, plumage, and habits of the present species, under the designation *Chestnut Coucal*, he gives an alleged representation of the latter, evidently copied from one of Gen. Hardwicke's drawings, which may possibly represent a distinct species described as follows:—

“One of these [Chestnut Coucals] in the collection of drawings of Gen. Hardwicke, was eighteen inches in length; the head, neck, and under-parts ash-coloured, streaked with white as far as the breast; over the eye a whitish stripe; belly and thighs marked with transverse lines of white; tail plain black, not greatly cuneiform, though much

rounded; wings as in the others. This was met with at Cawnpore in April, and is said to be a bird of the first year," which I greatly doubt.*

The *C. Phillipensis* is common to all south-eastern Asia and its islands, but has been suspected not to occur in western India, though, in the peninsula, Mr. Jerdon describes it as "a common and universally spread bird, frequenting wooded and cultivated grounds, in all parts, and found also in the more open spaces of thick jungles. It is often seen in thick hedges, also in woody nullahs, and in low bushy tracts. It feeds on the ground chiefly, walking and running with great facility,† and picking up various large insects, centipedes, lizards, and even scorpions and small snakes. It may often be seen walking along the bank of a dry tank, a bund of a paddy-field, and being a remarkably slow and stupid bird, and of slow flight, it is occasionally run down, or even caught by the hand, in sufficiently open ground. A good Shikra (*Accipiter Dussumieri*) will also easily strike it down.

"The *Mahooka* has a deep sonorous call, something like 'whoot whoot, whoot,' which is often heard in a thick bush or hedge, while the bird itself remains unseen"; — a dull, heavy sound, which, as Dr. Horsfield remarks, has suggested nearly the same name for the birds of this genus in many distant countries: it is *Bubut* with the Javanese; *Houhou* in Egypt; and *Toulou* in Madagascar;" to which may be added *Kooka* in Bengal, and *Mahooka* in southern India. The young bird almost constantly repeats a strange hoarse sound like a person choking (a sort of 'Guk, koh-koh',) which is not pleasant to hear. It is common in the vicinity of Calcutta, and Dr. McClelland remarks, that it is "very common in villages and cultivated rice-fields in Assam, and in low inundated lands along the banks of rivers. It delights in humid climates, as is proved by the vast numbers of them which occur in the Soonderbuns; but I question

* It both steps with alternate motion of the feet, and hops in a rapid and scrambling manner.—E. B.

† From specimens obtained since the above was transcribed, more or less barred on the upper-parts and mottled with whitish below, having also an ill defined superciliary streak, I now much incline to regard this Cawnpore specimen as a variety of *C. Phillipensis*.—E. B.

if they are to be found in India further northwest than Bengal." Certainly no figure of it occurs in the late Sir A. Burnes's collection of drawings of the birds inhabiting the Indus territory, which is tolerable proof of at least its rarity on the banks of that river. In Burmah, China, and the Malay countries generally, it is very abundant.

31. *C. viridis*: *Polophilus viridis*, Shaw; *Cuculus Ægyptius*, var. γ , Latham, *Ind. Orn.* 1. 213. *Le Coucou Verd d'Antique* (of the Philippines), Sonnerat, *Voyage a la Nouvelle Guinée*, p. 121. (GREEN COUCAL.) Described as nearly of the size of the European Cuckoo. The head, neck, breast and belly, obscure deep green, verging upon black; the wings of a deep reddish-brown; and tail long and black: bill black; and feet tinged with the same. Irides black (?). Plumage generally rigid, with the barbs of the feathers disunited (Sonnerat). Apparently much allied to the last species, but of inferior size, and differing somewhat in its colouring.

32. *C. lepidus*, Horsfield, *Lin. Trans.* XIII, pt. 1, p. 180: *Cuculus Tolu*, apud Raffles, *Ibid*, pt. II, p. 285. (PALE-BREASTED COUCAL.) In the catalogue of Javanese birds prefixed to his *Zoological Researches in Java*, Dr. Horsfield marks this species as "to be cancelled"; yet in his enumeration of the species procured by Dr. McClelland in Assam, this name for one of them is retained, with the remark, that "Mr. McClelland's specimen is comparatively of a large size, but agrees in all particulars with the *Cent. lepidus* of Java." (*Proc. Zool. Soc.* 1839, p. 166.) Now, in a note to the *Researches in Java*, the same naturalist writes — "I consider this small group to consist of the following species, agreeably to M. Cuvier's arrangement, as given in the *Régne Animal*, I. 426, in the note: — 1. *Cuculus Ægyptius* and *Senegalensis*, which are united by M. Cuvier, — 2. *C. Phillipensis*, Cuv., — 3. *C. nigrorufus*, Cuv., — 4. *C. Tolu*," (which is far from being a complete enumeration of the extra-Indian species now well ascertained); and it may be, therefore, that at the period of writing this, Dr. Horsfield followed Sir Stamford Raffles in considering *lepidus* as identical with *Tolu*, and certainly the description of the latter accords so nearly with a specimen before me, that I should not be surprised at their being identical, though, if so, it is remarkable that Dr. Horsfield should formerly have marked

the name *lepidus* as to be cancelled, without (as in other cases) placing the prior specific name in the opposite column. With regard to Dr. McClelland's Assamese bird, of which but one specimen was obtained, an excellent coloured figure of it is now in his possession, which has enabled me to identify with it, beyond doubt; a specimen procured at Chyebassa by Lieut. Tickell. The following is the original description by Dr. Horsfield: "Length twelve inches. The crown, neck, scapularies, and secondaries, dusky, the shafts longitudinally margined on each side with white: wing-coverts dusky or of a bay colour, with white shafts: primaries also bay, and tipped with dusky: the tail-feathers black, with a whitish terminal band, and with their coverts barred with ferruginous: throat, fore-neck, breast, and belly, white." Sir Stamford Raffles remarks that—"the colours of this bird vary considerably at different ages. When young it is of a greenish black, with rufous wings. As it becomes older, the belly becomes whiter, the shafts of the feathers on the head and back acquire a light colour, and the upper feathers of the tail become barred with grey. It lives on insects, is chiefly observed on the ground, and has a weak flight."

The single specimen before me is fortunately in a transitional state of plumage, which enables me to assert that its changes are analogous to those of the preceding species. The dark first plumage is mentioned by Raffles, and the present specimen is a young male exchanging its barred dress for the adult garb, which latter is far advanced towards completion. Length fourteen inches, of which the tail measures eight inches and a quarter, its outermost feathers four inches less; wing six inches; bill to forehead (through the feathers) an inch, and to gape an inch and a quarter; tarse an inch and five-eighths, and long hind-claw an inch and one-eighth, being (as Sir Stamford Raffles notices) proportionally longer than in *C. Phillipensis*. Bill pale horny, darker along the ridge of the upper mandible; and feet dusky-lead: irides carmine. Wings rufous-chestnut, less dark than in the preceding species, and tipped with dusky; the tertiaries suffused with fuscous, and such among them and of the secondaries as remain unchanged, are brighter ferruginous barred on both webs with black; the new greater wing-coverts are each slightly margined with a dusky line; the tail-feathers which have been renewed are wholly

glossy greenish-black, with obscure cross-striæ appearing at particular angles of reflection, but those which have not been shed are barred with rufous, for the terminal half in the middle pair, and on a successively smaller portion to the outermost; the upper tail-coverts are remarkably long, have a bright green gloss, and are more narrowly barred to near their base with rufous; the exposed whole upper surface of the partially spread tail thus appearing barred, while the unbarred part of the feathers is concealed by those which overlap them: the head, neck, and sides of the breast, are fulvescent-brown, with dusky lateral margins to the feathers, and rigid whitish stems, which thicken a little towards the extremity; scapularies similarly white-shafted, as also the fore-neck and breast, whereon the dusky lateral margins disappear; throat and middle of the breast and belly whitish; the flanks dusky; and sides, thighs, and lower tail-coverts, pale fulvescent with numerous blackish cross-rays: the new unbarred tail-feathers retain a whitish tip.

This appears to be a species of rare occurrence in India, as Dr. McClelland's Assamese specimen, and that here described from Chye-bassa in Central India, are the only instances of its having been obtained with which I am acquainted. It would seem to be more common in the Malayan Archipelago.

33. *C. Bengalensis*, Latham, *Ind. Orn.* II, 114, — *Gen. Hist.* III, 248. (PYGMY COUCAL.) Another rare species which is thus described by Latham. "This is a trifle larger than a Lark [eight inches long, Drapiez]. Bill dusky; head, neck, back, and wing-coverts ferruginous, marked with short white lines, bounded by black, pointing downwards; belly yellowish-brown; quills reddish-brown, the first and second primaries plain, the rest barred with black; tail very long, and cuneiform; its outer feathers dusky, with brown tips, the other marked with bars of black, and narrow ones of brown; legs black; the inner hind-claw straight. Inhabits Bengal". In this brief description may be recognised, with little hesitation, a transitional state of plumage analogous to that described of the two last species, and style of marking similar to that of *C. lepidus*. Mr. Jerdon, in his *Supplement*, remarks— "On the authority of Mr. Elliot, I insert this as a peninsular species, that gentleman having observed it in the Southern Mahratta country."

34. *C. affinis*, Horsfield, *Lin. Trans.* XIII, pt. 1, p. 180. Length fourteen inches and a half. Plumage black, wings ferruginous; the scapularies soot-coloured, with white shafts; outer tail-feathers having a white terminal band; hind-claw curved. Inhabits Java, and is there termed *Bubut-allang-allang*". Horsfield.*

I have now analysed, to the best of my ability, and to the full extent of the means at my disposal, the formidable array of names presented to the consideration of the student of oriental *Cuculidæ*; and I trust that I have effected something towards reducing the supernumeraries to the rank of synonyms: aided by European libraries and collections, I could of course have rendered the monograph more complete, but, as it is, I think, I have been fortunate in verifying the species of my predecessors, and particularly those of Latham, nearly all of which assigned to this region of the globe have, I think, been satisfactorily here identified. In every practicable instance, I have drawn up original descriptions, sufficiently detailed, I trust, to ensure the recognition of the species without doubt or difficulty; and this much required pioneering accomplished, it remains for those, who have the opportunity, to verify and enrich our knowledge of this interesting group of birds, by observing and recording their observations on their habits, distribution, &c., but especially on all that concerns their propagation, whether they incubate their own eggs, or to what other birds they consign the charge of them, and a variety of curious particulars connected therewith. I had long been of opinion, from various

* Here may be noticed the *Cuculus Sinensis* and *C. paradiesus* of Latham, respectively founded on *le Coucou bleu de la Chine, en langue Chinoise, San-hai*, and *le Coucou à longs brins*, of Brisson and Buffon, described by the former of these two naturalists from drawings by a M. Poivre, wherein there can be no doubt that the reversed outer toe was a fancy of the artist, and that the species delineated were *Pica (Cyanocorax) erythrorhynchus*, — which Dr. Cantor saw at Chusan,—and one of the Racket-tailed Drongos, probably *Edolius grandis*. Dr. Latham also describes a three-toed *Asiatic Cuckoo*, "supposed to inhabit India, and in the collection of Lady Clive. I find it also," he adds, "among the drawings of Gen. Davies taken from one in the collection of Mr. Thompson. Length eight inches or more. Bill nearly an inch, brown-black; nostrils scarcely conspicuous, being in great part covered by a membrane: general colour of the plumage dirty brown-black, inclining to lead-colour on the rump; sides of the chin, and throat, grey, mottled with black in short dashes; belly lead-colour; tail-coverts nearly black; tail the same, with a blue grey tinge, the outer feathers black on the inner web; on the outer white, with a black serrated streak indenting the white like a saw; shape of the tail cuneiform. It has only three toes, two placed forwards and one backward: legs brown."

data, that much more than the usual period intervened between the successive deposition of the eggs of the European Cuckoo, and that this was the reason it did not incubate its own, when the idea received confirmation, while the inference based upon it fell to the ground, on learning the remarkable circumstances connected with the propagation of the nearly allied Piayas (*Cureus*, Boié, *Erythrophrys*, Swainson,) of North America, wherein it has now been ascertained that the eggs are, *for the most part*, incubated by the parents, though so long a time elapses between the successive laying of them, that a newly laid egg, a hard-set one, a callow nestling, and another ready to fly, may be found together in the same nest, while other more advanced young ones still keep to the neighbouring branches. The whole account is, indeed, so strange and surprising, that I shall follow Mr. Yarrell in quoting the details from Mr. Audubon's fifth volume.

"Whilst at Charlestown in South Carolina," narrates Mr. Audubon, "in the early part of June, 1837, I was invited by J. S. Rhett, Esq., residing in the suburbs of that city, to visit his grounds for the purpose of viewing the nest of the yellow-billed Cuckoo [*Cur. Americanus*]. This I did in company with my friend Dr. S. Wilson, and we found ourselves highly gratified, as we were enabled to make the following observations:—

"A nest, which was placed near the centre of a tree of moderate size, was reached by a son of the gentleman on whose ground we were. One of the old birds, which was sitting upon it, left its situation only when within a few inches of the climber's hand, and silently glided off to another tree close by. Two young Cuckoos, nearly ready to fly, scrambled off from their tenement among the branches of the tree, and were caught by us after a while. The nest was taken, and carefully handed to me. It still contained three young Cuckoos, all of different sizes, the smallest apparently just hatched, the next in size probably several days old, while the largest, covered with pen-feathers, would have been able to leave the nest in about a week. There were also in the nest two eggs, one containing a chick, the other fresh or lately laid. The two young birds which escaped from the nest, clung so firmly to the branches by their feet, that our attempts to dislodge them were of no avail, and we were obliged to reach them with the hand. On now looking at all these young birds, our surprise was indeed

great, as no two of them were of the same size, which clearly shewed that they had been hatched at different periods, and I should have supposed the largest to have been fully three weeks older than any of the rest. Mr. Rhett assured us, that he had observed the same in another nest placed in a tree within a few paces of his house, and which he also shewed to us. He stated that eleven young Cuckoos had been successively hatched and reared in it, by the same pair of old birds, in one season, and that young birds and eggs were to be seen in it at the same time for many weeks in succession.

“On thinking since of this strange fact, I have felt most anxious to discover how many eggs the Cuckoo of Europe drops in one season. If it, as I suspect, produces, like the American bird, not less than eight or ten, or what may be called the amount of two broods in a season*, this circumstance would connect the two species in a still more intimate manner than theoretical writers have supposed them to be allied. Having mentioned these circumstances to my friend, Dr. T. M. Brewer, and requested him to pay particular attention to these birds while breeding, he has sent me the following note:— ‘The fact you intimated to me last July I have myself observed. The female evidently commences incubation immediately after laying her first egg. Thus I have found in the nests of both species of our Cuckoos one egg quite fresh, while in another the chick will be just bursting the shell; and again, I have found an egg just about to be hatched while others are already so, and some of the young even able to fly.’” It is well known that domestic pigeons will not unfrequently lay again, before their previous pair of young are fit to leave the nest, in which case, I believe, they generally oust the latter as soon as they can, though continuing to feed them: but a more analogous fact to that presented by the North American Cuckoos was announced by myself in 1833, as cited by Mr. Yarrell, respecting the propagation of the common Barn Owl (*Strix flammea*), — a bird common here, as well as in England and North America, where Mr. Audubon has

* A pair of Blackbirds on the large islet of St. James's Park, London, being the only ones at the place, and the hen so remarkably tame, that there could be no doubt of her identity throughout the season, reared and brought off four broods of young in one year, the three first consisting of five each, and the last of two only, seventeen in all; as many as in a Partridge's single brood, the latter only laying a second time when some accident had happened to the first brood.—E. B.

since observed the same of it, — and which, in like manner, continues to lay both while hatching and rearing its excluded progeny of different ages.

Moreover, what is still more remarkable, in connexion with the facts already stated, it appears that these Cuculine birds of North America do sometimes lay in the nests of other birds; while, like their European relative, they devour all the eggs they find: in opposition to which, may be cited a statement by Mr. Gray, that the European Cuckoo does not uniformly desert her offspring to the extent that has been supposed; but, on the contrary, “though she leaves the eggs to be hatched by another bird, sometimes at least she takes care of the young bird and feeds it after it leaves the nest, and teaches it to fly”*, as he declares to have personally witnessed in one instance. This much, however, is certain, that a large proportion of the young Cuckoos hatched in England do not see the light till after the parent-birds had left the country: and whatever may be the cause of the singularly early migration of this species, which retires southward at the hottest period of the year, while other migratory species (as observed in captivity,) are directly prompted by decline of temperature to undertake their long journey†, it has been plausibly enough suggested that it must be in reference to this that the Cuckoo is endowed with the instinct of burthening other species with the charge of its offspring; and it is worthy of remark (though I do not know that the analogy has been before adduced), that in the common British Swift (*Cypselus murarius*), which also quits for Southern climes remarkably early, though not so very soon as the adult Cuckoos, the migrative impulse is oftentimes sufficiently intense to impel the parent-

* *Proc. Zool. Soc.*, 1836, p 104.

† Having kept numerous migratory birds through the winter in England, I have repeatedly had opportunities of observing that the instinctive impulse to depart was thus incited, becoming moderate, in general, during mild weather, and enhanced with cold: the birds flapping and fluttering their wings, with beak pointed upwards, and often violently dashing against the roof of their prison, during the evening and night (being very rarely thus agitated in the day time), and continuing to evince this migrative restlessness, at intervals, throughout the winter. Food has nothing to do with it, and one of the most extraordinary circumstances connected with migration is, that the same individuals return to their exact former abode the following season, even captive birds turned loose having repeatedly been known to come back to their place of confinement; and this notwithstanding they travel by night, and perform aerial voyages of such vast extent!

birds to abandon their helpless later broods to starvation! Whether the instances adverted to by M. Audubon of the egg of the American Piayas being found in other bird's nests happened at a late period of the season, would be not uninteresting to ascertain.

But there is a remarkable genus of *Sturno-fringillidous* birds in the New World, the *Molothrus* of Mr. Swainson, consisting of one species in North America, and another (recently discovered by Mr. Darwin) in the Southern continent, both of which have been ascertained to resemble the typical *Cuculi* in entrusting their eggs to the care of other birds*; and a very interesting and minute account of the Northern species (*M. pecoris*, the "Cow Bunting" of Wilson,) by Mr. Ord, — the friend of Alexander Wilson, and continuator of his *American Ornithology*, — will be found in Loudon's *Magazine of Natural History* for February, 1836 (having been elicited, indeed, by some remarks which I formerly published on the habits of the British Cuckoo). From this article it appears, that Wilson was mistaken in his statement that "the Cow-bird continues to be seen so late as the middle of June; after which we see no more of them until about the beginning or middle of October". Mr. Ord asserting that they are common in Pennsylvania in July, from which I suppose may be inferred that after that time they disappear — it being just the period at which the adult Cuckoos quit England, and thus affording, if true, a remarkable analogy tending to support the hypothesis before noticed.

Conducted, however, to this result by studying the parasitic birds of temperate and Northern climates, it becomes desirable to ascertain how far the circumstances connected with the propagation of those of tropical countries may tend to confirm or overthrow such generalizations as are based exclusively upon the former; and in India especially, a wide field (in this as in everything else) is open to our investigation, hitherto quite unexplored, and certainly one which

* A strange oversight, in fact an abominable bit of careless writing, occurs in Mr. Swainson's notice of the habits of the Cuckoos, in his *Habits and Instincts of Animals* (p. 19), published in the series of Lardner's *Cabinet Cyclopædia*. Passing from the British species, whereof he iterates the current erroneous statement that it invariably selects the nests of *insectivorous* birds to deposit its egg in, he remarks — "the North American Cuckoos, however, being of a different species, more frequently lay their eggs in the nests of the Cow-pen birds (*Molothrus pecoris*)," &c.!!! Fine Ornithological doctrine this from *Magister Artis*!

from the variety of species and genera of *Cuculidæ* which have been here described, is very likely to disclose some new phases or modifications of procedure elucidative of the enquiry for what ultimate purpose do certain birds of this family, as also the American Molothrahs, consign the charge of their progeny to alien species. Already, it is well ascertained that the Coël — a permanently resident species — is parasitic, which is opposed to the hypothesis founded on the migratory habits of the Northern species, and I particularly recommend the study of all that relates to the propagation of this very common bird to those who may have the opportunity of making observations, as also that of another common species — the *Centropus Phillipensis*, besides which the *Cuculus fugax* appears to be everywhere abundant, and in Bengal the *C. (Oxylophus) edolius*. The Malkohas and their allies are much more common in the Malay countries than in India, and they are also particularly worthy of investigation : but the truth is that, in every instance, carefully recorded and trustworthy observations are needed, for their intrinsic interest as well as for supplying materials upon which to generalize ; and I trust that by furnishing a Monograph of the known species, I remove one principal difficulty on the part of many willing observers, who may oftentimes have been discouraged and deterred by the difficulty of ascertaining what bird it is they have been noticing, apart from which knowledge there is comparatively little satisfaction in noting down traits of habit, whence numberless curious discoveries may be said to die still-born, which otherwise might be turned to account.

The strictly parasitic Cuckoos (at least the British species, and it may be inferred the rest), together with the American Molothrahs, do not pair, as no object would be attained by their doing so, nor are they polygamous in the ordinary sense of the term, but the sexes are promiscuous in their intercourse ; whence a number of males may occasionally be seen chasing a single female at any period of the breeding season : and with regard to the Molothrahs, these are gregarious at all times, each female withdrawing herself from the flock and setting out in quest of other birds' nests when she wants to lay ; the which I mention, to notice a very curious observation by Mr. Nuttall (which I give from memory), to the effect that in the nearly allied genus of Troopials (*Agelaius*, Vieillot), in which the Molothrahs are still

often classed, and which also live in flocks, but construct a number of nests in society, the relative proportion of the sexes in the several breeding groups is extremely irregular, as if these birds also did not separate off into pairs. This alleged circumstance might be advantageously borne in mind when studying the habits of the Keelbills (*Crotophaga*) of tropical America, those very curious gregarious *Cuculidæ* of the West Indies and adjacent countries, of which the best account yet published is given in the *Annals of Natural History* for November, 1839.

Among the variety of curious phenomena presented in the Natural History of the European Cuckoo, it is remarkable that this bird devours what eggs there may be in a nest into which she introduces her own, so that any eggs that may be found together with that of the Cuckoo, have been laid subsequently to the deposition of the latter*: nevertheless, it appears that she spares that of her own species, or perhaps her own previous egg, as many instances have been recorded of two Cuckoo's eggs being found together, in general unaccompanied by those of the rightful owners of the nest. Hence, I incline to the opinion that she hastens to disburthen herself of her own egg, being very liable to be disturbed and driven from the nest by its legitimate possessors; and that then, if continuing unmolested, she picks out any other eggs there may be, but that when finding another laid by her own species, she is unable to distinguish that from her own, and so leaves both. From many experiments which I have tried with a view to elucidate this matter, I have found that, *generally*, in each case when a strange egg is put into a nest before the owner of it had begun to lay, that nest is deserted, — if it be placed along with the owner's eggs, it is very commonly ejected, — but, if substituted for the latter, then the duped bird will either incubate it alone, as the case may be, or lay other eggs to it, and sit on all. It is a question to be determined whether the egg of any Cuculine bird be ever found in nests with a domed top, as has been asserted, whereinto the bird could not have laid it, but must have placed it with the foot or bill; and what renders it unlikely that this should ever be the case with the British Cuckoo, and such others as resemble it in displaying

* See *Mag. Nat. Hist.* 1835, p. 334.

the same particular instinct, is that the young Cuckoo could not well in them eject its nest-mates, as described by Jenner and Montagu. What other parasitic species do this is also desirable to ascertain.

In physical connexion with the tardy development of the eggs of the European Cuckoo, and it may be presumed the North American Piayas, the remarkably small size of the parts subservient to generation in both sexes has been remarked, whence also the diminutive size of the egg (of at least *Cuculus canorus*, adapting it to that of the nests into which it is laid). Whether aught analogous occurs in the anatomy of the Molothrahs, I have not seen stated; and observations of the kind are needed as regards other *Cuculidæ*.

In fine, I may here remark that what knowledge we now possess of the general Ornithology of India, is particularly deficient in information concerning the nests and eggs of species, a knowledge of which is often of essential assistance in tracing the affinities of genera: and I would particularly recommend our few observers to bestow especial attention upon this department of Ornithology, and hint to them that a collection of eggs, with the species to which they belong very carefully ascertained, and of such nests as are conveniently transmissible, would be regarded as a valuable acquisition to the Museum which I have the honour to superintend.

THE AVATARS OF VISHNOO.

An abstract Translation from the Pudma Pooran. By E. C.

RAVENSHAW, *Esq. C. S.*

1ST INCARNATION OF VISHNOO, OR MUTCH AVATAR.

It came to pass in the Kreta Yug, (or Golden Age,) that Bramah sprang from the navel of Vishnoo, and was placed by the deity in Suttya-locum. Brahma being instructed in all things by Vishnoo, began the work of creation. He first called into existence the five elements: earth, air, fire, water, and ether (akash.)

2nd. The "nine Praja-puttee," (or nine Lords of the creation); viz. Broogoo, Mareechee, Utré, Duksha, Kurdama, Poolastea, Poolaha, Ungerasa, (Ungeyra?) and Kruttoo.

Mareechee had a son, named Kaseapah, who took unto him four wives, all Aditi,* Diti, Kurdooma and Venata. The first brought forth *Indra* and thirty-three krore of deotas. The second brought forth giants, (or Asooras) named Somak-asoor, or Hayagreeva, (meaning horse-face or centaur,) Jumbah, Miah, &c. The third wife brought forth serpents; viz. Adeeshaha or Ununta, (the 1000-mouthed serpent,) Tukshaka, Vasookee, Karkotaka, Padoomah, Maha Padoomah, Sunka, &c. The fourth wife bore two sons; viz. Arroon and Garrooda.

It came to pass that Somak-asoor, (the centaur,) rebelled against Brahma, and having come to Suttia-locum, forcibly carried away the four Vedas, and plunged with them into the sea. Owing to this loss darkness and confusion overshadowed the earth. Then Bramah arose, and assembling all the deities, proceeded to Tsherabdee, or the milky sea, where he offered up prayers and supplications to Vishnoo, that he would cause the Vedas to be restored. The deity rising from the milky ocean, promised to accede to their wishes. He immediately assumed the form of a large alligator and plunged into the depths of the ocean, where having killed Somak-asoor, he returned and delivered the four Vedas to Brahma.

2ND INCARNATION OR KOORMA AVATAR.

Utré (the 3rd of the Prujaputtee) had a son named Doorvasa who, having performed his devotions for one year at Maha Meroo, ascended to heaven (Swurga-locum,) and blessing *Indra*, presented to him a garland of flowers called Parejatam. The deity having benignantly accepted the offering, placed it on the head of the white elephant called Iravut, who took it off his head with his trunk and trod it under his feet. Doorvasa at this sight became very wrath, and he cursed *Indra* and all rich people, because they regarded not the offerings of the poor. In consequence of this imprecation, poverty fell upon *Indra* and his court. The sky withheld its rain, and famine and pestilence stalked abroad.

Then *Indra* and all the deotas went to Brahma, the four-headed god, and beseeched him that he would take pity on their miserable condition. Brahma replied, that it was not in his power to assist them, but that he should be happy to accompany them to Vishnoo. The party accordingly proceeded to the sea of milk, and invoked Vishnoo, who hearing their supplications, appeared before them with four hands, and riding on the back of Garrooda. He said, "The nature of your appeal is known to me, go

* Daughter of Duksha.

bring hither the mountain Mundara for a piston and the serpent Vasookee or a rope." The deities and giants flew to the mountain and removed it from its foundations, but were unable to convey it to the shore of the ocean. Then came Vishnoo to their assistance, and transported it to the centre of the milky sea, when he assumed the form of a Coormava, (or Tortoise,) plunged under the sinking mountain, and supported it on his back. Then the serpent Vasookee was twisted round the mountain for a rope, and the giants holding the head while deotas held the tail, they began to churn the milky ocean.*

It came to pass, that the venom of the serpent issued out of his mouth like a flame of fire, and the deotas and giants suspended their labour for fear of it. Then Roodra (Seva) spoke to them, exhorting them to fear nothing, and after offering up a prayer to the almighty Vishnoo, he swallowed the poison. The churning was resumed, and the following things were produced from the froth of the ocean. 1st A woman named Jaistoo-devee or poverty, who on appearing asked, "Where am I to reside?" The deotas answered, "Go where people are ever quarrelling, and sleep in the morning and evening time." 2d. Another female named Varoonee then appeared, of exceeding beauty. Andeshaha, (the 1000-mouthed serpent,) immediaty carried her off to Naga-locum. 3d. The ocean brought forth the Apsaras, or celestial choiristers, named Remba, Woorvase, Manake, &c. who were ordered to repair to Swerga-locum to entertain the deotas with dancing and singing. 4th. A white Elephant called Iravatum. 5th. A Horse called Oocheestravas. 6th. A physician called Dunwantry. 7th. The flowery tree Parijatam or Kulpa Vri-ookshan. 8th. A wishing Cow named Kamadanoo, who gave to her possessor whatever he wished. The latter six articles were appropriated by Indra on the eleventh day of the moon. On the morning of the twelfth day, Stremaha Lutchoomy, the goddess of plenty and good fortune, arose from the ocean. Her appearance was hailed with acclamation by the Host of Heaven. The angels struck their sitars, the Apsaras danced and sang, and the deotas poured flowers on her head, and a flood of light like moon-beams irradiated her person. The goddess enquired in what way she could serve them. Indra answered, "Oh, goddess dwell ever in the bosom of Vishnoo and exert your influence to preserve us from all evil and distress, and bestow on us the riches and abundance of the three worlds." The goddess intimated her acquiescence. Then Vishnoo rose from the ocean and accepted her for his spouse. The ninth and last product of the ocean was the amrootum, (or nectar.) The deotas and asoors began to quarrel about its possession, when Vishnoo

* Churning in India is universally performed by twirling the churn staff backwards and forwards with a rope.

having transformed himself into a beautiful damsel of sixteen years of age, called Mahany, appeared before them, and offered to divide the amrootum among them. On their consenting to this proposition, he commanded the deotas to be on one side, and the asoors on the other. She commenced by distributing to the deotas their share first. Rahoo, one of the asoors, had purposely neglected to obey the order to stand on one side, and had kept his place among the gods between the sun and moon; and thus received the share of a deota. The sun and moon, however, immediately informed Mahany, that he was an asoor. Upon which Vishnoo enraged at his deceit, assumed his proper form, hurled his *chukrum*,* or quoit, at the throat of Rahoo, and severed his head from his body. But having drunk the amrootum, or water of immortality, he could not die, and by way of revenge, he has since that time occasioned periodically the eclipse of the sun and moon.

3RD INCARNATION, OR VAR AVATAR.

There are four gates to the palace of Vishnoo in Vicoontum; at the west gate are stationed two heralds, named Jayau and Vijaya. It came to pass, that four penitents, called Sanaca, Janandanah, Sanotcoomara and Sanotsoojatah, arrived at the gate with the intention of offering up praises and thanksgiving at the feet of Vishnoo. The two heralds, however, refused to give them admittance, upon which the penitents cursed them, saying, "You shall be born again, and become asoors." The heralds enquired how long they were to continue in that form. "If you will be friends to Vishnoo, seven generations; if foes, three—choose!" The heralds preferring the latter, were born to the wife of Kascapah, named Diti, and were named Herunea-kasepoo and Herunea-aksha. The former became a mighty giant; he rolled the earth up as a mat, and went to dwell with the 1000-mouthed serpent in Patal-locum. Then Brahma, Indra, and all the deotas being terrified at his doings, came to the milky sea, and invoked Vishnoo, who appeared before them, and on learning what had happened, assumed the form of a wild boar, and penetrating into Patal-locum, killed Heranea-kasepoo with his tusks, raised the earth on the face of the waters, and restored it to its former condition.

4TH INCARNATION, OR NURSING AVATAR.

Heranea-aksha enraged at the death of his brother, in order to revenge himself on Vishnoo, proceeded to the mountain Meroo, where he fasted

* Like that used by the Seiks.

and prayed 10,000 years to Siva. The god pleased with his devotion, promised to grant him whatever he wished. The giant replied, "Let me not be subject to death by the hands of deotas or asoors, of men or angels, (gundarva,) cows, etsha, (musicians,) animals, birds, siddas (penitents,) saddeas, vedevudarus, kinnarus, kimpoorooshus, by the sword, by disease, by the cursing of resheess, Siva answered—"Be it so." The giant immediately stalked to Swerga-locum, conquered Indra and all the deotas, turned them out of heaven, and became master of paradise and the earth. He then took unto himself a wife Siva, named Kalleyane, (the daughter of Ootanapada,) who bore him a son, named Plumahalada. When arrived at the proper age, the child was sent by his father to the learned Shookrachary, to be educated in the sciences. When his education was completed, he was brought back to his father, and stood in his presence with becoming respect. The father pleased at his appearance and manners, received him very kindly, and having kissed him, and enquired what he had learnt. The young man replied, "By the glory of Vishnoo, who is the creator of all worlds, from whom I derive my being, and whose perfection is the object of my meditation, I will endeavour"—"Stop," vociferated the giant, inflamed with anger, "What means this? Bring me Shookra-chary!" On the appearance of the sage, he exclaimed, "Am I not master of the three worlds by the auspices of Siva, and have you not dared to teach my son to worship Vishnoo who slew my brother? Bind him hand and foot." Here Plumhalada interceded, saying, "Father! you do him wrong. He did not teach me to pray to the almighty Vishnoo, but to Siva, or you. The fault is mine, not his." Heranea-aksha admiring his answer, pardoned Shookra-chary; but said, "In future you must pray either to me or Siva." Shookra-chary also told him to obey his father. Plumhalada answered, and said, "Vishnoo is greater than Brahma, Sunkara, and all the other deotas, why therefore should I pay reverence to those who are only his servants? I who have obtained favor in sight of him, who is the Lord of Lords." Upon hearing these words, the enraged Heranea-aksha commanded his attendants to flay his son, cut him in pieces with their swords, and cast him into the fire. But neither the whip, the sword, or the fire had any effect; he stood unhurt, being supported by the glory of Vishnoo. Then Heranea-aksha asked his son, saying, "Where is Vishnoo? what is he? shew him to me, and I will overpower him, as I did all the other deotas." Plumhalada answered and said, "He is Narayanah, the spirit moving on the waters. He is Vau-soodeva, the spirit animating all created beings. He is Vishnoo, (the anima mundi,) the soul which pervades the material universe." "If that is the case," replied the enraged Heranea-aksha, striking a pillar, "Shew me

Vishnoo in this pillar, or I will stab you to the heart with my dagger." Immediately a terrible noise, like that of the loudest thunder issued from the pillar, the giants were struck senseless and the stars of heaven fell down like flowers from the tree, and the deotas all trembled. The pillar was rent in twain from top to bottom, and from the midst thereof issued Nara-singha, a beast having the head and neck of a lion, and the body of a man. He had three eyes which sparkled like flames, very long teeth, and 1000 hands, each armed with a different kind of weapon. The eyebrows and eye-lids of Herunea-aksha were immediately consumed by the flames that issued from the eyes of the almighty Vishnoo. Though daunted and trembling, the giant defended himself with his dagger, but Vishnoo seized him by the head and feet, and laying him across his lap, tore open his belly with his claws, and made his entrails into a necklacc. Then all the deotas poured flowers of the Parejatam on the head of the victorious Vishnoo. The Gundarvas, Kennaras, and Ethas played on various musical instruments, while the Apsaras danced. Luchmee brought the fruits of the earth to appease his hunger, and sat down upon his knee. Then Vishnoo sent for Plumbalada, and made him king over all the giants. He restored the deotas to Swerga-locum, from whence they had been expelled by Herunea-aksha, and disappearing, went to the milky sea.

5TH INCARNATION, OR VAMAN AVATAR.

Verochanah, the son of Plumbalada, had a son named Boli, who was king of the three worlds; during his reign all was peace and prosperity; the corn grew spontaneously; the cows yielded their milk without pressing the udder; the trees produced fruit in all seasons, and Indra and the Asta-dik-palakas* (or lords of eight corners of the world,) attended at the gate of his palace. Caseapah and his wife being desirous to see their son Indra restored to the sovereignty of the three worlds, paid adoration to Vishnoo for 10,000 years. The deity pleased with their piety, told them to ask for whatever they wished. Caseapah replied, "I wish you to be born to me as a son by the name of Oopa-Indra, when you must conquer Boli, and deliver the three worlds to Indra." Vishnoo accordingly became incarnate as the son of Caseapah, and day by day increased in wisdom and in stature. It came to pass, that Boli held a yoga, or burning sacrifice; upon the celebration of this ceremony, the son of Caseapah transformed himself into a dwarf, called Vamana, and walked before the king, who being pleased with him, told him to ask a favor. Vamana replied, "Be pleased to give me three steps

* Vide separate account of these.

of ground on which to make a burning sacrifice." Shookra-chary, the priest, observed, "Oh, king! this is not a Brahmin, but is the Almighty God in disguise; therefore do not grant his request, he will cause you to repent the gift." Boli rejoined, "If as you say, he is indeed the Almighty, it will be better to propitiate him with this small charity, than to refuse his request. I who am lord of the three worlds can well afford so trifling a gift." He accordingly gave Vamana permission to measure three steps of ground, upon which the body of the dwarf began to expand, and his stature increased to the height of 75,000 laks of leagues, one foot covered the whole earth, the other filled the sky. Vamana then asked Boli, "where shall I place my other foot." "On my head," said Boli. Accordingly the foot that was in the sky was placed on the head of Boli, and Vishnoo pressing it downwards, descended with Boli through the earth to Patal-locum, where leaving Boli, he returned and re-instated Indra in the sovereignty of the three worlds.

6TH INCARNATION, OR PARASOO-RAM AVATAR.

Brugoo, (the first of the nine Prajaputty,) had a son named Jamadugny, who having paid his devotions for 1000 years to Indra, found favor in his sight, and was permitted to ask for any thing he wanted, Jamadugny then requested that he might be put in possession of Kama-danoo, (the wishing cow, which was produced from the churned ocean.) The cow was accordingly brought to him, and by her aid he acquired great wealth and happiness. He took unto himself a wife named Ranooka-devy, who was the daughter of Ranooka. In order to obtain a son, Jamadugny prepared a pootra-kaumastey ag, or burning sacrifice to Indra. The deity pleased with the offering, promised him that Visbnoo should be born to him as a son; accordingly his wife conceived and brought forth a son, and called his name Rama. At ten years of age, he was sent to Salagram, for the purpose of being consecrated to the worship of Vishnoo. He there met with Kaseapoo, one of the nine Prajaputty, who being pleased with his attentions and piety, gave him a prayer called "*Vishnavee*."

In the mean time a king named Karteveerean Arjoon, the son of Hahaya, reigned in the city of Joteshmate on the banks of the Narmada, (Nurbudda?) He had 1000 hands, and a wife called Madooravane. One day he went with his wife and concubines to bathe in the river Nurmada, and placed 500 of his hands as a wall in the water, while with the other 500 hands he played with his women. It came to pass, that Ravanah a giant, arrived at a place lower down the river; after bathing, he erected in the river an image of clay, and began to worship it. Owing to the sports of king Arjoon

and his women, the waters of the river swelled and became trouhled, so that the idol, with the flowers and incense, were upset and carried down the stream. Ravanah sent messengers to ascertain the cause of this commotion of the waters; on hearing the cause, he was inflamed with anger and went up to fight against Arjoon, hut the latter overcame him, and put him in prison for 10,000 years; after the lapse of this period, Arjoon was orderedc by Brahma to release him.

It came to pass, that the king paid a visit to Jamadugny, who received him very kindly, and served him and all his retinue with rare and excellent food. The king inquired, whence he procured such delicious provender. The penitent replied, that the Kamadanoo furnished him with every thing. The king then hegged the penitent to give him the wonderful cow, hut Jamadugny replied, that it belonged to Indra, and that it was not therefore in his power. Then the king forcihly seized Kamadanoo, hut she resisted, and with her horns and feet killed many of the royal retinue. The king enraged at his failure, stabbed Jamadugny with his dagger, and returned to his capital.

Ramah, the son of Jumadugne, having finished his education at Sala-gram, and having received an axe from Vishnoo as a reward for his piety, returned to his father's house, where he beheld his corpse. Hearing the manner in which he had been slain, he shouldered his axe and went to the city of Joteshmati, and standing upon the gate, sent word to the king, that a Brahmin was come to fight with him. The king hearing this, sent 100 kinkaras to chastise him, hut he killed them all with his axe. The king then came out himself, hut Parasoo-Ramah, (or axe-bearing Ramah,) immediately cut off his 1000 hands, and then killed him with the axe; after which he laid about him right and left, declaring that he would not suffer the world any longer to be polluted with the Kshatrea caste. He performed the tarpenum, (or ceremony of anathema,) in the blood of the Kshatreeas, hy mingling their blood with gingle (?) seed in the earth, and crying confusion to the nakedness of their fathers and grand-fathers. This ceremony was performed at Lamantaka Punchakum (or the five streams) near Kooroo-Kshatrum, where he also made a hurnt offering called auroovamadum, and presented the 750,000 *kos* of land, which composed the country of the Kshatreeas, as a charitable gift unto the Brahmins. He then prepared to offer up his thanksgiving to Vishnoo, but was prevented by a Brahmin, who said, "You have given this land to the Brahmins, and have no tittle to make use of that which is no longer your own, go, and appear not again within its limits."—Parasoo-Ramah enraged at this treatment, cursed him, and said, "You will not be able to retain

dominion over this land." He then departed to the mountain Badaricastreemun.

7TH INCARNATION, OR RAM AVATAR.

Aditi, the daughter of Duksha, and wife of Caseapah had a son, named Viouswatah, who was one of the twelve suns. The latter had a son named Swaembhoo Munoo, who worshipped Vishnoo 10,000 years on the banks of the river Goomtee. Vishnoo then appeared to him, and told him to make a request, Swaembhoo Munoo accordingly besought him that he would be born to him as a son for three generations; Vishnoo consenting, disappeared.

It came to pass that in the Tretu Yoog, Swaembhoo Munoo was born to king Ujan in the city of Ayodeea, (Oude,) and was named Dasarada. He married Cosilliah, the daughter of the king of Cosala (Cosillah*) and Soomitry, the daughter of the king of Maugada, and Kykae, the daughter of king Kikiah. Not being blessed with a son by any of his wives, he, by the advice of Vasista, the penitent, made a burning sacrifice, called Pootra-kamasty, (son-wishing.) During the ceremony, there appeared in the midst of the flames a very handsome youth, with a golden cup in his hand full of panes (?) or rice milk. He spoke to Dasarada, ordering him to divide the contents of the cup among his three wives, who accordingly each drank their share of the celestial liquor, and immediately became pregnant. After ten months, Cosala brought forth Rama. Soomitry had two sons, Luchmun and Satroogna; and Kykae Bharata, they were all named by Vasistah. It came to pass when they were grown up, and were educated in the arts and sciences, that there came to Dasarada a penitent, named Vesooa Mitra, who requested him to allow his sons, Ramah and Luchmun, to attend at a burning sacrifice, in order that the giants might be deterred from interrupting the ceremony. The king ordered his sons to accompany the penitent, who taught them two arts, called bula and utte-bula.

The giants, of whom the penitent was apprehensive, were named Mareecha and Satbahoo, the sons of Tatakas, (the daughter of the angel Sookatoo,) and Sinda, her husband. After the death of their father, the two sons united together to mock and jest at a penitent called Ugusteah, who being very much provoked cursed them, and transformed them into giants. These giants to revenge themselves on the race of penitents, were in the habit of disturbing their devotions, and obstructing their

* There is a river of this name, which rises near Almorah, and unites with the Ram Gunga below Moradabad.

burning sacrifices. Vesooa Mitra being anxious to get rid of such troublesome neighbours, desired Ramah and Luchmun to kill them. The brothers accordingly sallied forth, and encountering the giants, slew them with the edge of the sword, and cast them into the sea.

Visooa Mitra then celebrated his burning sacrifice, after which he proceeded with the two brothers towards Mithoola Nuggur. It came to pass as they journeyed along, that Rama observing on the road-side a stone statue of a woman, asked the penitent what it was. Visooa Mitra replied, "Once upon a time there was a very handsome young woman named Ahiliab, who was the wife of the famous penitent Goutema. She committed adultery with Indra, and Goutema discovering her infidelity, transformed her into stone." Ramah on hearing this, touched the statue with his foot, and it immediately became an animated and breathing form. From thence they came to the city of Mithoola, the capital of king Janaka. It is necessary to premise, that this king having no children, ordered that a piece of ground should be dug up, and prepared for the burning sacrifice of Pootra-kamesty. The labourers on digging the ground, discovered a very curious golden bow, inlaid with nine sorts of precious stones, which they brought to the king, who opening it, found therein a beautiful virgin, by name Setah, who shone pre-eminently among the maidens, as the moon among the stars. (*Velut inter ignes. Luna minores.*) Janaka presented her to his wife, who treated her with great kindness. A few days after, the queen brought forth a daughter by name Oormulla. When the two virgins had arrived at a marriagable age, the king issued a proclamation, saying, that "Whoever is able to string the bow of Roodra Danoosoo, to him will I give my daughters in marriage."

Now the history of the bow was in this wise: "Visooa Kurmah, the carpenter of the gods, had a son named Miah, who aided the giants in constructing the three cities called the Trepooras, situated in the three worlds; viz. heaven, earth, and orcus, or upper, middle, and lower worlds. Then Miah and the giants began to annoy the deotas, kings and penitents, by interrupting their devotions and burning sacrifices, (Yogaus;) at last, all the gods went to Roodra, (Siva,) and solicited his aid. Roodra immediately destroyed all the giants excepting Miah, who made a well filled with the waters of immortality, into which he threw the bodies of the giants, who were thereby restored to life, and again waged war with the gods. As it was necessary to prevent the giants from again having recourse to the well, Vishnoo transformed himself into a cow, and ordered Brahma to assume the shape of a calf. Both then went to the spot apparently to graze, but when arrived at the well, the calf fell in, and the cow in apparent anxiety to rescue her offspring, tumbled in after it, and drank

up the living waters." This object being effected, Roodra converted mount Meroo into a bow, and took the serpent Vasookey for a string, and Vishnoo for an arrow. The sun and moon formed the wheels of his chariot, the four Vedas were his four horses, driven by Brahma as coachman, and the ocean was his quiver of arrows. Thus armed, he charged the giants, and fired the arrow Vishnoo into the midst of them, all fell dead in a moment. Roodra made a present of the bow to Davarat, grand-father of Janaka, and it has remained with the family ever since. Ramah being made acquainted with the terms of the proclamation, took the bow in his hands, easily bent it back, and adjusted the string, and fired the arrows in rapid succession. The conditions being fulfilled, Janaka gave his daughter Seta to Ramah, and his second daughter Oormulla to Luchmun; after the celebration of the nuptials, the brothers set off on their return to Oude. In the way they met Parasoo Ramah, who addressed Ramah, saying, "Your father Dasarada refused to fight with me, and ran away. I hear your prowess is great. Let me see if you can bend this bow." Ramah said he would do his best, he then took the bow and bent it, and discharged the arrows. Parasoo Ramah then said, "Oh Ramah,* you are indeed very powerful, he who can bend this bow, can build a staircase to heaven with the heads of kings."

The brothers then proceeded on their journey, and arrived safely at Oude with their wives, where they lived very happily with their parents.

Dasarada being now advanced in years, wished to place Ramah on the throne; upon which his wife Kikia observed, "Once upon a time when you and I went out in a chariot to hunt in the vicinity of Jountopoor, a giant named Sumbarasoor came to fight with you. If you remember well, you discharged your arrows and drove the chariot. In the midst of the fight, the linch-pin of one of the wheels fell out, and the chariot would have fallen had I not put my finger in the place of the linch-pin, and kept it there until you had killed the giant. For this service you desired that I would ask some favor and it should be granted. I said that I had nothing to ask for at that time, but that I would make a request at some future period, to this, if you remember, you assented. The time is now arrived, and my request is this, that you banish Ramah for fourteen years to the jungles, and appoint my son Bhurata as king during that period." Dasarada being bound to perform his promises, granted her request. Then Ramah and Luchmun with their wives departed from Oude, and came to the city of Chitrakoot. When Dasarada heard that they had left Oude, and gone into the jungles, he became exceeding sorrowful and died. Then

* Original obscure—supposed meaning.

Bharata went to Chitrakoot, and informed his brothers of the event, who returned with him and performed the funeral rites of the deceased. After the ceremony, Rama being sorrowful, lay down his head upon Seta's lap and fell asleep. Jauntah, a son of Indra, having quizzed the penitent Stootaseras about his huge head and uncouth figure, the latter transformed him into a crow, and since that time he was called Kauk-asoor. This crow being tantalised with the sight of one of Seta's breasts as she sat supporting the sleeping Rama, alighted on her shoulder, and began tearing the flesh with his beak. As Seta could not defend herself without awakening Rama, she bore it with resignation. Rama on opening his eyes, saw the blood flowing from her breast like a river. In his anger he prayed over the grass of the fields, and each blade became an arrow and flew in the direction of the crow, who seeing no escape from such a shower of missiles, threw himself at the feet of Rama and implored his pardon, which Rama at last granted. The party then arrived at a place called Purnasala, where they lived in a hut made of leaves during about thirteen years.

Visravas, the grandson of Poolustca, one of the nine Pruja-puttee, married Kakesey, the grand-daughter of Sookasa, and daughter of Soomaly. One night lying with her husband, Kakesey conceived and bore a son, and called his name Ravana. He had ten heads and twenty hands. Another night she conceived a son named Koombhakurna, and a daughter named Soorpanaky. On a third night she conceived Vebeshun, who became a devotee of Vishnoo. Ravana and Koombhakurna went to the mountain Himavunta to worship Roodra. To prove his devotion, Ravana cut off his own ten heads with his sword, and presented them as an offering to Roodra instead of fruits and flowers. Seva appeared before him and said, "Whatever thou askest, that will I give unto thee." "I pray thee," answered Ravana, "that I may not be subject to death by the hands of gods or asoors, angels or devils." Roodra replied, "Be it unto thee even as thou wilt." Then Ravana waged war against the gods and penitents, who being sorely pressed, went to Vishnoo and implored his assistance. In the mean time Soorpanaky, the sister of Ravana, went to Rama at Purnasala, and requested him to marry her. Instead of complying with her request, he cut off her nose and ears, and sent her away. She accordingly departed, crying aloud, to a place called Janakasthan, the residence of the giants Khara, Doo-shana, and Treserus, who had an army of 14,000 strong. She shewed them her wounds, and solicited revenge. The giants then arose with one accord, and fought against Rama, who slew them with the edge of the sword. Soorpanaky then fled to her brother Ravana, and informed him of what had happened. Ravana immediately ordered the giant Mareecha to

transform himself into a deer, and to appear before Seta, Rama, and Luchmun. The giant obeyed. Seta on beholding the deer asked Rama to catch it, and bring it to her to play with. Rama said, "It is a giant and not a deer, however, I will try to catch it for you." Taking his bow and arrows, he followed the deer, which ran away as Rama approached. When out of sight of the hut, Rama shot the deer with an arrow, when the giant resumed his shape, and crying out "Oh Seta! Oh Luchmun!" gave up the ghost. Seta hearing this, and believing it to be the voice of her husband, desired Luchmun to go and see what was the matter. He said it was only the giant, crying out on being killed by Rama. Seta not being satisfied, again begged him to go; so he went. Ravana immediately appeared before Seta in the form of a dervise, (or kulundur,) and asked for alms; on her bringing him what he required, he seized her in his arms, placed her on his chariot, and carried her away to Lunka. On the road a large kite attacked Ravana, who, however, having placed Seta under a tree called Sensoopah, in the orchard called Usoka, succeeded in wounding the kite.

In the mean time Rama and Luchmun returned to the hut, and not being able to find Seta any where, they were overcome with grief. Coming to the place where the kite lay half-dead, the kite told them that Ravana had carried her off to Lunka. They then came under the shadow of a large tree, from the branches of which the giant Kubunda tried to seize them for his prey, but the brothers slew him. At last they arrived at the dwelling of a woman named Sabary, who offered them fruits, and hearing their tale, said, she would introduce them to her friend Soogreva, lord of the monkeys, who would be able to assist them in recovering Seta. On the appearance of Soogreva, Rama asked him why he lived in such a place where there were no people to be seen. Soogreva answered, "My history is this; Vrooksha Ragasoo my father, once went to Nymes-arenneam, where there are two tanks. There is one of them in which if any man bathe he will be transformed into a woman, and in the other, if a woman bathe she is transformed into a man. My father plunged into the first, and rose therefrom a beautiful woman. Indra and the Sun both descended from Heaven to make love to her; by the one she had a son named Vaulu, and by the other myself. Soogreva, my father, then bathed in the second tank, and resumed his manhood. On arriving at Kiskinda, he appointed my brother Vaulu king, and then went to the mountain Himavunta. My brother happened to kill a giant named Magavee, by cutting him in two pieces, which he threw at the penitent Muttunga Maha Moony, who with his eyes shut was praying on the mountain Reshia Mooga Purvatum. At this unpleasant interruption, the saint opened his eyes and cursed Vaulu, saying, 'If he ever comes here, his head shall be broken in a thousand pieces.' After this it came

to pass, that my brother fought with the giant Doondoobhy, and entered into a large cave in a mountain. My brother ordered me to remain at the entrance until he came; I waited a very long time, at last seeing blood come out of the cave like a stream of water, and thinking Vauly had been killed, I was sore afraid, and rolling a large stone before the entrance of the cave, I returned to Kiskinda. My brother after having killed the giant came to the mouth of the cave, and kicked away the stone I had placed there. Not finding me on the outside he was very angry, and on arriving at Kiskinda, turned me out of the city; since which time I have lived in these mountains. Now if you will kill my brother Vauly, I will engage to recover your lost Seta." Then Rama went up against Vauly, and slew him and placed Soogreva on the throne of Kiskinda, (i. e. Bijanugur, according to the tradition of the Natives on the spot.) Then Soogreva summoned before him his prime minister Hunooman of the monkey tribe, gave him the signet ring of Rama, and commanded him to assemble the generals of the Vanoras, (or monkeys); viz. Ungada, the son of Vauly; Jambavunta, lord of the bears, who was born of a groan of Brahma; Neela, the son of fire, &c., and that he should march Southward, sending out parties of Vannoras to the four quarters of the world to seek intelligence of Seta, and return within one month, on pain of death.

Hunooman accordingly set out on his march to the south, but was unsuccessful in his search. At last he entered a cave which was very dark, but perceiving at the extremity a small light he advanced towards it, and found a woman named Swaemprabha, (angel of light,) making devotion. On telling her that he and his friends were very tired and thirsty, she shewed them a rivulet running through the cave, and gave them fruit; after they had refreshed themselves, she enquired who they were, and why they had been wandering about her cave for the last forty-five days. On being informed of the circumstances, she ordered them to shut their eyes, and not to open them until she permitted them, when they would find a large bird called Sumpaty, who would give them news regarding Seta. They obeyed her orders, and on opening their eyes at the appointed place, they discovered Sumpaty, who said, "Seta is at Lunka; I saw her with my own eyes. You are now on the shore of the south sea, and the island of Lunka is 150 leagues distant. If you can jump so far, you will see Seta sitting under a tree in an orchard." The party then consulted among themselves as to who was the best jumper. Neela said he could only jump seventy-five leagues. Nola thought he could accomplish 105. Jumbavunta said, that being now advanced in years, he could not be sure of clearing more than 135. Ungada believed that he could jump there, but was afraid that he would not be able to jump back again.

This being the case, Hunooman took upon himself to perform the feat, and accordingly sprang from the shore into the air, cleared the sea, and alighted safely at Lunka, but he was immediately attacked by the goddess of the island; however, he gave her such a violent blow on the breast that she fell senseless; on recovering half an hour afterwards, she exclaimed, "You have struck me as the thunder-bolt cleaves the earth, so will you strike and conquer Lunka!" Then Hunooman transformed himself into a small cat, and entering the capital of Lunka searched about everywhere for Seta; at last he found her sitting under a Sensoopa tree in the orchard Usoka, as Sumpaty had said. He then resumed his own shape, and prostrating himself at her feet, delivered to her the signet of Rama, and acquainted her with the measures that had been taken to restore her to liberty. Seta gave him an emerald ornament called Seromany to deliver to Rama. The next day Hunooman began to tear up all the trees in the orchard. The astonished gardeners fled to Ravana, and told him that a wonderful monkey was tearing up trees by the roots, the leaves of which even had defied the blast of the tempest. Ravana hearing this, sent one lak of giants to kill him, but Hunooman slew them all. Ravana then sent the sons of his eight prime ministers with a large retinue, but they shared the same fate. He next sent five generals with a large force of disciplined troops, but with no better success. Ravana's second son, Ukshaya-koomar, a valiant hero next entered the lists, but he also bit the dust. At last the eldest son, Indrajit, went forth to battle. He aimed many arrows at Hunooman without effect, finally he aimed the sacred arrow Bramhastrum, which overthrew Hunooman, who was immediately seized, and carried to the presence of Ravana, who enquired who he was, and why he came there. Hunooman replied, "I am a servant of Rama, who sent me to see Seta." Ravana then asked him, why he had destroyed the orchard. He answered, "I did it in order to obtain an interview with you; in order to tell you that if you do not deliver up Seta, you will be slain by Rama, who has pledged himself to the penitents to kill you with his own hand; otherwise I should have killed you myself." Ravana enraged at hearing these words, ordered his attendants to execute him; but Vebeshun, the younger brother of Ravana, stepped forward, and represented that it would be unjust to slay an ambassador, but that some more lenient punishment might be inflicted. Ravana admitting the propriety of this advice, ordered his attendants to bring tar, wax, camphor, and oil cloth, and having twisted them round the tail of Hunooman to set fire to it, and after carrying him through the town, to thrust him out of the gate of the city. These orders were immediately carried into execution; but no sooner had they lighted his tail, than he

whisked it about from house to house, and set fire to the whole city, and escaping from the gate ran to the sea shore and jumped back to the place where he had left the army of the Vannoras. He then returned to Kiskinda, and prostrating himself at the feet of Rama, acquainted him with all the circumstances of his journey, and delivered the emerald he had received from Seta.

The next day Rama, Luchmun, Soogreva, Hunoomon, Ungada, Neela, Nala, Jumbovanta, Sooshana, (the doctor of the Vannoras,) Gajau, Gundamadana, Gavantsbha, Vrooshabba, Sarava, &c., with their respective Vannora forces, marched from the mountain Reshia Mooga Parvut to the shore of the south sea. Vebeshun hearing that Rama had arrived at the opposite coast, advised his brother Ravana to give up Seta, and make his peace with Rama; but Ravana offended at his advice, turned him out of the city. He sought refuge in the camp of Rama, who promised to place him on the throne of Lunka.

Nala, the son of fire, then commenced to make a bridge over the sea. He prayed to his father that all the great stones and other heavy articles that were necessary for the work might be deprived of their weight, and float on the sea. This prayer being granted, he soon completed the bridge over which the troops marched to Lunka. Then the giant generals of Ravana, named Dhoomraksha, Ukumpana, Vugra Dumsthraw, Prahusta, Uttaka, Mohakawe, Koombha, Nikoombha, &c., came and fought against them, but were all slain in one day. In the night, however, Indrajit attacked them furiously, with frequent discharges of all kinds of arrows, and by hurling mountains on the heads of the Vannoras, great numbers of whom were killed and wounded, so that Indrajit reported to his father that he had killed them all.

Jumbovanta consulted with Sooshana, the doctor, what was to be done. The latter replied, "There is a mountain near the North sea* called Sunjeevy, on which grow three kinds of shrubs named Sunjeevy-kurney, Sandane-kurny, and Souselia-kurny; send Hunooman to fetch them, otherwise we shall all die." Hunooman flew to the mountain, but after searching on the four sides of the mountain, he was unable to find the shrubs, on account of the darkness of the night, so he took up the mountain in his arms and brought it to Lunka before sunrise, for he was the son of the wind. Then Sooshana, the doctor, gathered medicinal herbs and applied them to the wounds of the Vannoras, who immediately awoke from the sleep of death, and began to hurl the mountains on the houses of the enemy. Koombhakurna, the youngest brother of Ravana, came out with a large

* Polar Sea, or Arabian?

force to attack them, and fought for twenty-four hours without intermission, when the battle was terminated by the death of Koombha-kurna, who was killed by an arrow from the bow of Rama.

On hearing the news of his brother's death, Indrajit came forth with an immense army, and waged such a war as never before had been witnessed by deotas or giants; the arrows, mountains, trees, and all kinds of missiles fell upon Rama's army as the rains descend in the season of the monsoon. At last Indrajit fell by the hand of Luchmun. As soon as the intelligence reached Ravana, he sallied forth with his principal ministers and disciplined troops, and fought seven days and nights with Rama, who riding on the shoulders of Hunooman, discharged quivers of arrows at the giant, and cut off several of his heads and hands, but they immediately grew up as before. In the mean time Rama was growing faint in the exertion, from the pain of a wound from one of Ravana's arrows, which had pierced through, and was sticking in his side, from which blood flowed as fast as the water of the Red river. At this critical period, a rut or chariot descended from heaven, sent by Indra, driven by Matully, a skilful charioteer. Vebeshun at the same time informed Rama, that Ravana could not be slain until the cup of nectar which he carried in his breast should be destroyed. On hearing this, Rama ascended the car, charged the enemy, and aimed an arrow of flaming fire, called agnia-astrum, which flew like a thunderbolt, and split the breast-plate of Ravana to pieces, and crushed the cup. He then aimed 101 arrows to cut off the heads and hands of the giants, but again and again they grew up before until all the nectar was dried up, which had been spilt over his body. Then Rama discharged the arrow brumahstrum, which put an end to his existence. The war being thus concluded, Vebeshun was placed on the throne of Lunka. For the purification of Seta, a large fire was prepared with camphor, tar, wax, sandal-wood, &c. Then Seta bathed herself in a stream, and adorning herself with ornaments and flowers, walked three times round the blazing fire, and then on a signal given by Rama, threw herself into the fire, which, however, was immediately transformed into a man, who caught her in the palm of his hand, and presented her uninjured to Rama, who having accepted her, they mounted the car Poospoca Vemanum, and with Luchmun, Soogreva, &c., returned to Ayodea-nugur, (Oude,) where Rama dismissed his allies with numerous presents, seated himself on the throne of his fathers, and ruled over the kingdom for 10,000 years, when he departed to Vicoontum, his celestial abode.

8TH INCARNATION, OR KRISHN AVATAR.

MSS. Imperfect.

9TH INCARNATION, OR BOODH AVATAR.

The giant Tarukasoor had three sons, Viddoonmaly, Tarukaksha, and Kamalaksha. In a battle between the gods and giants, Tarukasoor was killed by Indra. The sons fasted and prayed for 1,000 years to Brahma, who pleased with their devotion, told them to ask for whatever they wished, and it should be granted. They replied, "We wish in the first place, for three moveable cities completely furnished with every article of luxury; and secondly, that we may not be subject to death by the hand of Gods, Danavas, Yekshas, Rakus, Gandurvas, Sidda Saddia, Kinnara, Kimpoo-roosha, Ooroga, &c."

Bramha granted their request, with this proviso, that if the cities should ever come in contact with each other, they should all be killed by a great man. The three brothers then repaired to Mya, the architect of the giants, who made for them three cities: one of gold, one of silver, and one of iron; each city was 150 leagues square, adorned with palaces, gardens, and every thing conducive to pleasure. The golden city was in the centre, the silver one in the sky, and iron one on the earth. Thus by the blessings of the Trinity and Mya, the giants enjoyed themselves exceedingly, and amused themselves with tormenting the gods, penitents, &c. To complete their power, the son of Tarakaksha obtained from Brahma a nectar well, in which if a dead body were plunged, it would come out alive with ten others equally powerful. By these means, the three brothers were enabled to fight the gods with impunity, and overthrow them. Reduced to extremity, they petitioned Brahma to save them from the effects of the power he had granted to the giants. Brahma told them to go to Roodra, who on their supplicating him, attacked the giants with such force, that the field was covered with their dead. However, their wives came and touched them with their hands, sprinkling water over their persons, and they awoke from their sleep, for their wives being very virtuous women, could give life to the dead. The giants on their recovery, renewed their attacks upon the gods, who were again obliged to supplicate the aid of Roodra. The latter replied, "Unless the virtue of their wives be corrupted, it is useless to kill them, because so long as their wives remain virtuous, they will be able to restore them to life." The gods then proceeded to Vicoont, and entreated Vishnoo to lend them his assistance, to which he consented. It came to pass, that the wives of the Trepoora-soors were dancing round the Uswuttum, which is the king of trees, and endeavouring to obtain the fruit which hung from its lofty branches. Vishnoo assuming the form of a priest, told them they would not be able to procure the fruit unless they danced round the tree naked. On

their obeying his injunction, Vishnoo pervading the tree as he pervades all things in heaven and earth, shook it with a noise like thunder; the women being frightened clung naked round the tree, which immediately assumed the form of a naked young man, in whose embraces they enjoyed the fruit of their desires, but lost that virtue which gave immortality to their husbands. Roodra immediately availed himself of their fall to attack the giants, whom he destroyed together with their three cities.

Vishnoo incarnate as a naked man is called Boodda, who established the science called Boodda Sastrum, which taught the abolition of the worship previously paid to the deota under the names of Vishnoo, Seva and Brahma, and prescribed the adoration of the godhead under the name of Boodda, and the observance of the new commandments contained in the Boodda Sastrum. Vishnoo after the promulgation of this new covenant, told the gods to rejoice and be glad, as their enemies had been destroyed, and then disappearing, returned to Vicoont. Since that period, the religion and science of Boodda have become prevalent in the world.

10TH AVATAR.

At the end of the Kalee Youg, Vishnoo will be born as a son to the Brahmin Dhurman-bhooshum. He will have the face of a horse, and will appear riding on horseback with a dagger in his hand, with which he shall smite the wicked, but the good will be rewarded.



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